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THE
FAR EASTERN
REVIEW

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Vol. XXXV

MARCH, 1939

No. 3

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VOL. XXXV

SHANGHAI, MARCH, 1939

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FAR EASTERN CROSS-CURRENTS



R. HIROSHI SAITO, former Japanese Ambassador at Washington, died on February 26, after having been in poor health for the past year or so. He was 52 years of age.

Upon learning of his death, Mr. Cordell Hull, Secretary of State, expressed his regrets in publishing a communique voicing the great sorrow that the news had caused him, and added:

"During the past five years, Mr. Saito worked ceaselessly, with understanding and sympathy, for the maintenance of friendly relations between his country and the United States.

"Problems which were brought up called upon his failing strength to such a degree as perhaps to hasten his end.

"Mr. Saito lived as a devoted and loyal servant of his Emperor and his country, and his death will be deeply regretted by his fellow citizens and by the many friends that he made in the United States and other countries where he had served."

Mr. Saito was one of the best English writers and speakers of Japan. He was also well versed in Chinese classics and poetry. He commanded the love and respect of many Japanese officials in diplomatic service, who are much grieved by his untimely death.

Mr. Joseph C. Grew, United States Ambassador to Japan, called at the Foreign Office on March 2, and made the offer to transport the remains of Mr. Saito to Tokyo aboard an American cruiser (later decided to be the U.S.S. *Astoria*). The offer was gratefully accepted by the Japanese Government, and Mr. Seiji Yoshizawa, Director of the Bureau of American Affairs, called on Mr. Grew at the American Embassy in behalf of Mr. Hachiro Arita, Foreign Minister, and asked Mr. Grew to convey to the American Government the Japanese Government's deep appreciation of the manifestation of friendship, as well as for the respect shown to Japan's diplomatic representative by President Roosevelt.

President Franklin D. Roosevelt called on Mrs. Saito on March 4, to express condolences on the death of Mr. Saito, and profound gratitude of the Japanese Government for his action was expressed by a spokesman of the Foreign Office.

The House of Peers voted special thanks and appreciation to the American Government and the President on March 7, for the offer to transport the remains of the late Mr. Saito aboard the *Astoria*.

The *Astoria* is expected to arrive at Yokohama on April 17. Preparations for the reception of officers and men of the cruiser are being made jointly by the Foreign Office, Navy Ministry and the local authorities. The Foreign Office has asked the Diet to vote ¥30,000 for the reception.

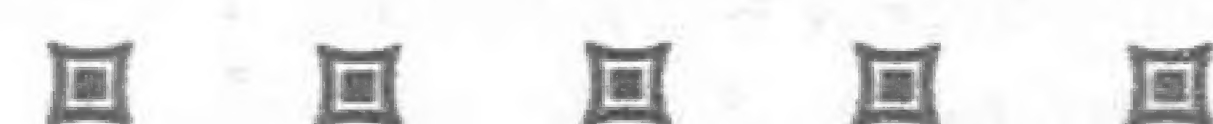


The Chinese population of Canton is reported to have passed the 700,000 mark following the decision of the authorities to allow ferry-junks to resume sailing between the city and inland points, according to a Reuter report of March 1. Thousands of people, who fled into the surrounding countryside on the advent of the Japanese, are now flocking back by means of these ferry-junks.

No less than 100,000 persons are said to have entered the city from neighboring villages during the past ten days. In the main, however, they are of the very poor class, and will have to be supported by friends or the authorities until they find jobs.

Living conditions in the city have taken a great stride forward in the past few days. The majority of the streets are again brilliantly lighted at night, with the restoration of electric power, while tap water and even telephones are again available in most districts.

The Japanese military authorities are lending a hand in cleaning up the city. In many areas, Japanese soldiers may now be seen working side by side with Chinese coolies in removing debris and giving streets a much needed washing. As soon as the work of cleaning up the roads is finished, the authorities intend to increase the present rather limited transportation facilities.



The hoisting of the flag of the Chiang Kai-shek Government was disallowed by the authorities of the French Concession in Shanghai on March 12, the 14th anniversary of the death of Dr. Sun Yat-sen. In Chinese-language newspapers an announcement had been published under the name of the local headquarters of the Kuomintang urging the people of Shanghai to fly the flag at half-mast to commemorate Dr. Sun Yat-sen, Father of Chinese Revolution.

Although the authorities of the International Settlement did not interfere with the hoisting of the flag, the matter is being considered by the Municipal Council, according to an official of the Council who was quoted by the *Shanghai Times* of March 14. It had always been the desire of the Council to follow a neutral policy in such matters and only take drastic action when emergency arose, and if the peace and order of the Settlement be threatened, the officer said. So far, that emergency had not arisen, but the fact had not been lost sight of that some action might be necessary at a future date, he added.



The attitude of the Shanghai Municipal Council regarding the co-operation with the Japanese authorities for the suppression of anti-Japanese terrorism in the International Settlement was clarified in its statement issued on March 14.

"In view of misleading reports which have appeared as to the understanding recently reached between the Japanese Gendarmerie and the Shanghai Municipal Police, it is considered desirable to issue a summary regarding what has taken place."

Beginning with these words, the statement went on to explain the Council's attitude that it welcomed the co-operation of the Japanese Gendarmerie and Consular Police, while maintaining the integrity of the Shanghai Municipal Police.

Then the statement referred to the points established during the conversations which were conducted between the two parties in order to work out details of the co-operation.

There is no foundation, the statement added in conclusion, for the suggestions that have appeared in certain press reports that offices of the Japanese Gendarmerie are to be established in Shanghai Municipal Police Stations, or that Japanese Gendarmerie will be stationed in Shanghai Municipal Police Stations. Nor is there any foundation for the report that the Commissioner of Police has agreed to the supervision of Chinese Police by the Japanese Gendarmerie.

The negotiations mentioned above took place between February 22 and March 3, according to the statement.

The issuance of the statement was rather belated and criticized by the press. The Japanese authorities did issue a communiqué on March 4, giving a rough idea of the agreement reached, while a Japanese naval spokesman in Shanghai revealed on the next day that promises of support were conveyed to the Japanese authorities by the commanders of the various foreign defence forces.

The *North-China Daily News* of March 6, commended the agreement in its editorial entitled "Satisfactory Results" and stated in conclusion:

"The terms of agreement as announced in the Japanese Communiqué indicate that a very realistic view has been taken of the situation. That is entirely as it should be, and it is necessary that the terrorists should be made to realize that the neutrality of the foreign areas of Shanghai will be maintained at all costs. They should form no base for hostile acts against the Japanese or their protégés, and those who are guilty of such should, when apprehended be treated in the manner which has been suggested. That is not only a question which affects the security of the foreign areas, but is a matter of common justice."

Foreign and Chinese newspapers confuse, intentionally or not, ordinary crimes and anti-Japanese terrorism, but this British journal does not. The above editorial advised in one part that:

"Efforts should not be merely directed towards the extermination of the political assassin but towards a general improvement in the crime situation, to the restoration of good order and the eradication of those focii (referring to the so-called bad lands in the western district of Shanghai bordering upon the International Settlement) which undoubtedly attract the attention of criminal elements."

Although murders are not new in Shanghai, as in every other metropolis, but the situation took a serious turn in the latter part of January. A day hardly passed without an outrage of political nature.

The *North-China Daily News* of March 2, regretted in its leading article entitled "Chungking's Duty" that the *China Times*, Chinese newspaper published in Chungking, sought to defend the campaign of terrorism, and endowed it with all the excellent qualities of patriotism, and stated:

"The campaign, and the article which thus supports it, constitute a most grievous betrayal of the best interests of the foreign inhabitants of the areas in question, and the millions of Chinese who seek refuge within them from the horrors of war. To advance patriotism as a reason for the perpetration of crimes is as cowardly as they are futile."

Emphasizing the neutrality of the foreign areas, the journal went on to say:

"The question now arising is as to whether that neutrality which strengthened the positions of both parties (Japanese and Chinese forces fighting around Shanghai) over a year ago should now be abandoned in order to permit the Chinese assassins to use the Settlement and the Concession as a base for irregular hostilities against the Japanese and the Chinese who work under their aegis. It is now highly objectionable that the Chinese should seek by these acts of terrorism to destroy that neutrality of which they were only too willing to avail themselves when it came to the fighting around Shanghai. . . . There must be as much protection against the Chinese as against the Japanese which the former have on occasion so strongly demanded. In that, and in that alone, can proper justice be done to the foreign areas of Shanghai, and in this the Chinese Government bears a very real and onerous responsibility."

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Manzo Kawasaki, 70 years old, who was Superintendent of the Tokyo School of Law and Politics, an institution for Chinese students where Chiang Kai-shek and Wang Ching-wei studied, will leave Japan late in April for China to see his former students who are now important figures in Chinese politics. He will first go to Peking where he intends to see Yin Ju-keng, of the Provisional Government, for whose marriage with a Japanese girl he acted as go-between. Mr. Kawasaki then will visit Nanking, Shanghai, Canton and other Chinese cities to encourage his former disciples to make efforts for the new order in the East Asia.

Interviewed by the *Miyako*, the aged, whitebearded educator recalled; "The Tokyo School of Law and Politics was established in 1914 by Mr. Mitsuru Toyama.

"The school was located at Kanda. The director was Dr. Tohru Terao and I was the superintendent of students. Wang Ching-wei was a very clever young man and was always at the top of his class. When I heard that he fled from Chungking, I was not surprised. He is clever enough to take a far-sighted view of things in the Far East.

"I even acted as go-between for the marriage of Yin Ju-keng and his Japanese wife. Mr. Yin fell in love with her while studying at my school. Many of the students who were under my care are now important men in China. The school closed in 1919.

"I am going to China for the second time, having been invited by Chiang in 1929 to the memorial services for Sun Yat-sen in Nanking. I shall do my best to awaken my former students to their mission in creating a New China."

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Gratitude for Japanese protection of church property and peaceful civilians was voiced by American Protestant missionary the Rev. David S. Tappan, at Kungchow, Hainan Island, on February 14. Chinese citizens taking shelter in the church were saying that they would go home within a few days as they saw no danger of being molested by Japanese troops within the city, he stated.

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A recent Japanese-American loan deal satisfied Japanese governmental and financial circles as it was considered to show that Japan's actual financial stability was recognized in the United States.

An important arrangement between financiers in New York and Japanese electric power interests has been revealed by the announcement that Messrs. Dillon, Read & Co., of New York, have agreed to the transfer of all the property of the Daido Electric Power Co. of Tokyo to the Japan Electric Power Generation and Transmission Co., which is a newly created nationalized corporation.

The Daido Company's property was mortgaged as security for two loans floated in the United States by its fiscal agents, Messrs. Dillon, Read & Co. The first amounted to U.S. \$15,000,000 to be redeemed in 20 years, while the second to U.S. \$13,500,000 redeemable in 25 years.

Although the loan contracts stipulated that the property could not be transferred, negotiations were entered into with the American capitalists and carried on in a friendly atmosphere to reach the successful result.

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In connection with financial assistance to China by third Powers, it is strongly rumored that the British Government is considering other measures, which may probably mean economic sanctions against Japan. Japan on her part does not seem to be greatly disturbed at the prospect of sanctions. Mr. Hachiro Arita, Foreign Minister, stated at the plenary meeting of the budgetary committee of the House of Representatives on March 8, that invocation of economic sanctions against Japan was unlikely, basing his opinion on the view that "Britain, America and France well know that they would themselves suffer economic losses" should they apply sanctions. But later he said that a definite plan for a mobilization of commodities had been drawn up "as we cannot be absolutely certain that the adoption of sanctions against us is impossible."

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The compulsory evacuation of the populace of Chungking by March 31, was ordered in a notification issued by the Chungking City Government on March 2, according to Chinese dispatches.

The Municipal authorities are planning to evacuate at least two-thirds of the populace by the end of March, it was stated.

Most of the Chinese banks and shops and their entire staffs in Chungking have also been ordered to evacuate the city to designated areas in the outskirts.

For the evacuation of the populace, the authorities have chartered steamers of the Min Sen Steamship Company of Szechuen, while buses belonging to the South-West Transport Corporation will be used for evacuation by land.

All who fail to evacuate the city by the end of March will be forcibly ejected, unless unavoidable business or official duties prevent them, the report said.

Reuter reported on March 11, that police, gendarmes and the Three People's Principles Youth Corps were mobilized for the enforcement of compulsory evacuation of the Chungking populace.

The same agency reported on March 13, that many Government offices are leaving Chungking for places outside the city limits in order to avoid possible Japanese aerial attacks.

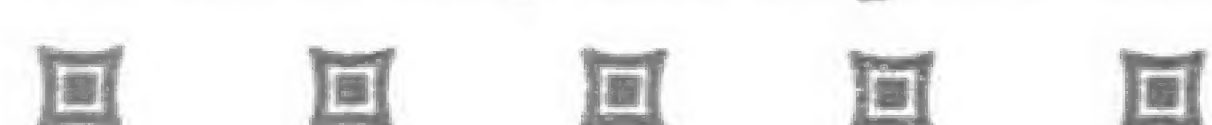
The Ministry of Education and the Department of Political Affairs of the National Military Council will be among those leaving Chungking. The Ministry of Communications is said to have concentrated over 70 steamers there for the evacuation of civilians.

Chengtu, it is understood, will start compulsory evacuation of civilians next month.

While the compulsory evacuation of Chungking is put under way, the Central Broadcasting Station there has officially announced

the commencement of broadcasts over a new 35-kilowatt shortwave station for Britain, France, Italy, Germany, North America, Siberia, Manchoukuo, North China, Japan, the South Seas and Soviet Russia, according to a Reuter report of March 14.

The new station was constructed by the Marconis Wireless Telegraph Company of Britain, the report stated.



The Chungking Government seems to attach great importance to the development of lines of communication in the north-west, as well as in the south.

Minister of Education, Chen Liu-fu stressed at a conference, held at Chungking in the end of February and attended by about 300 prominent Chinese engineers and industrialists, that besides the development of the national defence, one of the most urgent tasks is to develop the industries in the hinterland, while General Chen Cheng emphasized the importance of an immediate expansion and development of the communication lines in the interior of China, particularly northwestern provinces. Extensive reforestation projects are likewise planned.

According to the *North-China Daily News* of March 9, Chungking and Moscow have agreed to build a 3,000 mile motor highway between China and Siberia.

The road will reportedly start from Szechuen, pass through Hanu, Urumtsi, Chuguchak to the Russian frontier, and at Sergiopol, a station on the Turkestan railway, it will join the main Siberia-Russia highway.

The construction of such a road is said to have been proposed to the Chinese Government by the famous Swedish explorer, Dr. Sven Hedin.

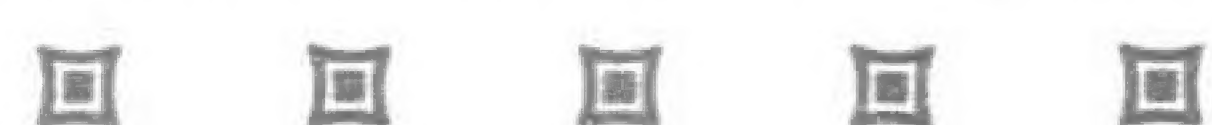
It is claimed that the highway will be of great economic and strategic importance to China. It will pass through territory as large as Europe excluding Russia.

Working parties totalling 700,000 men are reported to have been mobilized for the purpose by the Chinese authorities, and work on the road has already begun.

The stretch between Sergiopol and Chuguchak will be built by Russian workmen at the expense of the Soviet Government, it is said.



In North China under Japanese occupation, the South Manchuria Railway Company is considering the formation of a communication network, including railway, bus and shipping services. It will eventually spread over Japan and her possessions, Manchoukuo and China—North, Central and South. Coupled with the encouragement of air services, the new networks will greatly facilitate communications between these countries.



Apart from ordinary merchant ships, Japan tops the list of the number of fishing boats, with Soviet Russia, the United States and Great Britain following. Three thousand fishing boats, accompanied by floating canneries, leave Japan in the spring every year for their fishing grounds in the Okhotsk and Bering Seas. They are ready to go this year too, but parleys in Moscow on the matter are delaying progress.

While negotiations are still going on, the Soviet Government sought to auction off 293 fishing lots, including "stabilized lots" leased by Japanese concerns, at Vladivostok on March 15. Meanwhile Japanese fishery interests maintained a calm attitude, and the Ides of March passed quietly, contrary to wild rumors. Shares of the Nichiro Fishery Company, the largest of the Japanese fishing concerns operating in northern waters, were quoted only one point lower on the stock exchange.

On the same day, the spokesman of the Foreign Office issued a statement which recalled the negotiations patiently carried on by the Japanese representative in 16 conversations occupying more than 40 hours and blamed Moscow for its non-conciliatory attitude, and concluded that:

"It is the intention of the Japanese Government to continue diplomatic negotiation to the last moment and to put forth every possible effort with a view to bringing the question to an amicable conclusion.

"But it is hardly necessary to say that there is a limit.

"Such being the case the Japanese Government may find itself finally compelled to make a firm decision. In such an eventuality it must be remembered that all responsibilities therefor should be borne by the Soviet Union."

It may be recalled that Admiral Mitsumasa Yonai, Navy Minister, told the Diet on March 10 that Japan was "determined to defend her rights and interests regardless of the attitude of the Soviet Union," while Mr. Hachiro Arita, Foreign Minister, stated in the House of Peers on March 13, that the Japanese Government was "fully resolved to provide full protection to Japan's fishing rights."

Japan's rights to fish along the Siberian and Kamchatka coasts and in the Okhotsk Sea date back to 1875 so far as a written agreement is concerned, when a treaty was signed between Imperial Russia and the Japanese Government, confirming Japan's fishing rights, which were the same as those of the Russians. These rights were reaffirmed in Article XI of the Portsmouth Treaty, and the detailed arrangements were provided in the Russo-Japanese Fishery Convention signed in 1907.

Japanese fishermen went to these waters every year, and the Soviet Union has never repudiated the agreements. But the Soviet Union later compelled the Japanese to bid for fishing lots in competition with Soviet trusts. Since then the Japanese fishing industry has contributed much to the Russian treasury. The Japanese complained that they had to pay for their lots in Russian roubles while the state-controlled trust of the Soviet Union needed little cash to pay.

The so-called "stabilized lots" were created by mutual agreement of the two countries to be set aside for the Japanese fishermen.

In October, 1936, negotiations by the representatives of the two countries on the revision of the agreements, which were about to expire, resulted in a new draft treaty and the signature of the representatives were affixed to it. The treaty was ratified by the Emperor of Japan, but Moscow refused, on the pretext that Japan had adhered to the Rome-Berlin axis.

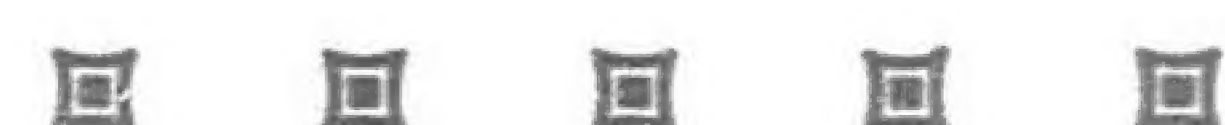
Another knotty problem still pending between Japan and Soviet Russia is the oil concession in North Saghalien.

Mr. Arita expressed the view at the Diet on March 10, that Japan still had five years to carry out soundings for oil drilling operations in Soviet-controlled Saghalien.

The Japanese interests, under an agreement concluded on October 10, 1936, secured a five-year concession to carry out sounding in a 1,000 square kilometer area in North Saghalien, Mr. Arita recalled. "Soviet obstructionist methods," he charged, "had prevented Japanese operations in 1937 and 1938, giving the Japanese still five years to conduct their explorations."

Singular attention has been drawn to the fact that the staff of the Soviet Embassy in Tokyo was reduced to a Chargé d'Affaires, M. Constantin Smetanin, and a Second Secretary, M. Peter Anuroff, and to reports that M. Smetanin may be shortly withdrawn.

Two years ago the Embassy staff numbered 14 officials, including the Ambassador, a Commercial Counsellor, Counsellor, Military and Naval Attachés, with assistants, a Japanese language secretary and six secretaries.



In the light of the tension existing between Japan and the Soviet Union, an article published in the *Pravda* arrests attention. It was written by a delegate to the 18th Congress of the Communist Party of the Soviet Union from the Bolsheviks of the maritime territory. The article described the industrial achievements in the territory and concluded:

"The Bolsheviks of the maritime territory authorized us to tell the 18th Congress and Stalin that they would follow the road of rapid industrial and agricultural development, and would transform this territory in the years of the Third Five Year Plan from a consuming one into a producing one, and would set up an impregnable fortress of Communism on the Pacific coast."

According to a Domei report of February 25, Soviet domination of Sinkiang, also known as Chinese Turkestan, has extended from the military to the economic field.

About 10,000 Soviet troops, consisting of a sniper brigade and motorized units, are stationed in Sinkiang, with headquarters at Urumtsi and Hami respectively.

Soviet Consulates have been opened at Ali, Urumtsi, Tahcheng and Kashgar, while Soviet economic domination in the area was effected through co-operative societies established at various towns, special attention being paid to Kashgar and Singsinghsia.

At the latter town there are a Custom House, a munitions depot, a co-operative society, an airfield and a number of raw wool warehouses, all of which were established and are managed by the Soviet authorities, the report added.

Loans to China

IN the light of the situation in North China, it is a matter of no little significance that the successful conclusion of the Chinese currency and credits scheme was announced in the House of Commons on March 8, by Sir John Simon, Chancellor of the Exchequer.

The stabilization loan is to the value of £10,000,000 of which half will be subscribed by the two British Banks, the Hongkong and Shanghai Banking Corporation and the Chartered Bank of India, Australia and China, and the remainder will be found by two Chinese Government Banks. The arrangement is to be that the fund will operate for twelve months, but may be continued for further periods by agreement, while it is understood that the interest is exceptionally low.

For the administration of the fund, a Sino-British Joint Commission will be organized in Hongkong shortly. It will be composed of five members, two representing the British Banks, two others the Chinese Banks, and the fifth being jointly appointed by the Chinese and British authorities. Accordingly, a situation may arise in which the Chinese currency will be under the partial control of the British banks, with the possible political consequences.

The *Times* of March 9 wrote: "The establishment and working of the Stabilization Fund has nothing to do with many financial measures which the Japanese have attempted, nor has this step been taken for any political purposes," and the *Financial News* of the same day shared the view. However there is no room for doubt that the scheme has everything to commend it as a political gesture, as well as a financial manoeuvre, at least from the British and Chinese standpoints. And it is naturally regarded in Japan as indicating another unfriendly move. Japanese officials tended to regard the motive of the scheme as entirely different from that embodied in the extension of the Exports Credit Guarantee Act. Financial circles were inclined to consider it as evidence of the difficulties confronting the Chungking Government in maintaining the value of its currency as a result of the heavy drain on Chinese foreign currency holdings.

In extending economic assistance to China, the French Government has joined Britain and America. It is guaranteeing payment in substantial amounts of Chinese purchases from France and is guaranteeing also credits which French manufacturers have extended to China.

Apart from the major credits already extended to China for the purchase of transport equipment, America has supported the Chinese dollar by the purchase of silver from China. It is interesting to note that the House of Representatives defeated, on February 28, an amendment to the Treasury Appropriation Bill which would have limited the Treasury's purchases of silver to domestic newly-mined metal, by the narrow margin of 155 votes to 135. The sponsor of the amendment was Mr. John Taber (Republican, New York), who charged that the United States, as a result of the Treasury's foreign silver purchases had been paying for the Sino-Japanese and Spanish wars.

Action in Japan

In Japan, the Diet discussed the currency policy towards Central and South China on March 11.

Replying to an interpellation, a spokesman of the Asia Development Board said that it would be difficult to include Central and South China in the yen bloc in view of the current position of the national currency of the Kuomintang Government, but that the Japanese Government was considering the matter with a view gradually to incorporating Central and South China in the yen bloc.

The Finance Minister, Mr. Sotaro Ishiwatari, admitted the necessity of placing Central and South China outside the yen bloc to some extent, in consideration of the trade with those parts of China which gave Japan foreign currencies. He drew attention, however, to the circumstances which did not warrant the absolute exclusion of these regions from the yen bloc, including the considerable amount of Japanese currency in circulation in Central and South China, and also military requirements.

Chinese Bullion for America

Another set of reports which drew the attention of observers in connection with the currency situation of China came from Manila through Reuter dated March 7 and 8.

A small French coaster is reported to have arrived at Manila from Indo-China on March 7, carrying 400 tons of Chinese silver and gold earmarked for America. The shippers of the bullion are said to be the Bank of Indo-China.

The consignment is valued at U.S.\$7,000,000, being composed of 4,831 cases, including 2,251 cases of "small money" in silver, 2,522 cases of "big-money" in silver, and 58 special cases of silver and gold. It is being shipped direct to New York aboard the *President Garfield*.

The name of the French coaster has been established as the *Laos*, Reuter reported, and it brought the cargo from Saigon, via Haiphong.

Chinese Trade and Currency

The Provisional Government of China announced on March 2, that imports and exports in North China would be controlled from March 11, when exports of specified products only would be authorized by the Customs on production of an "exchange selling certificate" showing that the necessary exchange at the rate of 1s. 2d. has been sold to the Federal Reserve Bank.

This requirement applies to goods going to Central and South China as well as to foreign countries, except to Japan and Manchoukuo. The new regulations will apply to all ports from Tsingtao northwards.

Meantime, the Federal Reserve Bank will establish the Foreign Exchange Bureau in its main office in Peking, with branch bureaux at Tientsin, Chefoo and Tsingtao, and offices in Tsinan and Shih-chiachwang.

In effect, the new regulations will cause North China to become part of the present Japan-Manchoukuo currency bloc, which maintains an official exchange rate of 1s. 2d. against the Japanese yen or the Manchoukuo yuan.

Coupled with the previous announcement prohibiting the circulation of bank-notes issued by the banks of the Kuomintang Government, this announcement claimed the attention of official and financial circles in London. At a joint consultation of the Foreign Office, the Treasury, the Board of Trade and representatives of Far Eastern banks, held in London on March 3, various retaliatory measures were reported to have been discussed.

Expecting some difficulty in circulating Federal Reserve Bank notes in those areas where bandits and guerrillas are still active, the Provisional Government decided, on March 9, to divide North China into "Reserve Bank-note Zones" and "Bandit Zones." The "Reserve Bank-note Zones" include those areas near the principal North China cities where the head office and branch offices of the Federal Reserve Bank are established, and anyone found carrying the old Chinese national currency in those areas is liable to a fine and the confiscation of their property. In the "Bandit Zones," which will be gradually merged into the "Reserve Bank-note Zones" as soon as peace and order are re-established, the old bank-notes are left to circulate for the time being.

The above decision on the eve of the enforcement of the prohibition seems to have been misreported in London. Reuter reported on March 10:

"Although official confirmation is not available that Peking and other towns have been excluded from the new currency zone in North China, the report is in accord with the expectations of financial circles in London. Japanese businessmen are reported as sharing the general opinion that the original scheme must prove to be unworkable.

"It is also believed in political and financial circles that the Japanese have no desire to embitter Anglo-Japanese relations too far.

"Hence the latest order is regarded as a face-saving device, lifting from the original order centers which really matter, and applying it to others of little or no importance."

However the same agency had to report from Peking on March 11, that the towns of Peking, Tientsin, Tsingtao and Chefoo were included in the "Federal Bank-note Zones."

Situation in Burma

The successive announcements of loans or credits to the Chungking Government by the so-called "Democracies" seem to have claimed the major concern of the Japanese people, whose eyes were formerly focussed upon the arms transit through Burma and Indo-China. However it still continues.

Mr. Toyoji Kaneko, Japanese Consul at Rangoon, who returned to Tokyo on March 13, after residing in Rangoon three years, told newspapermen that:

"Bonded warehouses at Rangoon are full of arms and ammunition consigned to China, including 5,000 tons of war materials landed from a British freighter on November 6 last year and other supplies landed from many vessels of various nationalities.

"Arms and ammunition are not being sent to China in large quantities, because the Chinese are not paying import duties.

"Supplies on which import duties have been paid are being transported into China by 16-ton motor lorries, but difficulty is being experienced as the strip of the Yunnan-Burma highway from the border to Lashio has not been completed.

"Reports were heard that arms consignments in transit often were seized by bandits in western Yunnan."

A Domei report of February 25, stated that certain big British corporations in China have launched an energetic program to assist the Chungking Government by facilitating the transportation of arms and ammunition into Nationalist territory through Burma.

The joint program provides for the improvement of transportation facilities in Burma by water, highway and rail, the report said. Warehouses for the storing of China-bound war material are rising at various points, principally along the Irrawaddy River, used to carry arms and ammunition from Rangoon to Mandalay, and along the highways from Rangoon to Lashio, it was stated.

Meanwhile, efforts to rush to early completion the railway from Kunming to Tali in Yunnan province are being pushed, the report continued.

As indicative of the development of Rangoon into the principal port for the importation of arms and ammunition into China was cited the decision of the American Pioneer, Isthmian and President lines to designate Rangoon as the landing place for China-bound cargo. This step was ascribed to the reinforcement of the Japanese coastal blockade against Chinese shipping following the occupation of Hainan Island.

The United Press reported from Paris on March 9, that the French authorities, acting as agents of French capital, were negotiating with British interests for financing the construction of the proposed Kunming-Burma Railway to give China a modern "life-line" to the sea.

Then China will have three arteries in the south, the Kunming-Haiphong Railway, the projected Kunming-Burma Railway and the Kunming-Burma highway.

With regard to the last-named highway, what Mr. Mare Chadourne, a French novelist-journalist, told a representative of the *China Press* on March 3 is interesting. According to the paper, Mr. Chadourne believed that China's great asset was the speed and efficiency with which the road to Burma was being built. He was told by a foreign League of Nations engineer that the road was a magnificent piece of work, and it was complete for the dry season, but more work would be required to prepare it for the rainy spell. He witnessed at Kunming the first 25 trucks of supplies arrive along the road. He added that the road was being used almost exclusively for supplies, and it was hard for any civilian to receive permission to make the trip.

Question in Commons

The Yunnan-Burma highway caused the Shan States—situated in the borderlands between China, Siam and Burma, and enjoying British protection—to figure in the House of Commons on March 6.

Sir Arnold Wilson, Conservative, asked whether any provisions had been made with a view to preventing the "almost unlimited incursion of Chinese into the Shan States, as a consequence of the construction of the new road." According to his information, a large number of Chinese, much larger than ever before, were entering Burma by this road, while the Shan States were putting 25 per cent of their revenue into the Shan States Federal Fund, and were entitled to maximum protection and financial assistance from Burma to "prevent over-running by Chinese coolies."

Lieutenant-Colonel Anthony Muirhead, Under-Secretary of State for India and Burma, said that Sir Arnold raised a point of wide and considerable interest, and his speech showed numerous aspects of the construction of the new Burma road, but there was no unusual influx of Chinese, and the particular problems envisaged by Sir Arnold would not materialize during the next year.

It may be recalled that the majority of the vernacular press in Burma have been greatly averse to the opening of this highway. First of all, the Burmese people fear that, as Sir Arnold said, a large number of immigrants from China will rush into Burma the moment the highway provides facilities for regular traffic and would seriously compete with the nationals there. However, the Government of Burma stated unequivocally that, if such a tendency for immigration were to arise, necessary steps would be immediately taken to put a stop to it. Another argument against the highway is the fear that Burma would unnecessarily involve herself in the Sino-Japanese conflict if large quantities of arms and ammunition were to pass through her territories.

These fears on the part of the Burmese people are ascribed by the British press to pro-Japanese propaganda alleged to have been carried on since a few years ago. However, there exists in Burma a strong Chinese anti-Japanese society which places on the heads of Japanese residents and consular officials prices ranging from Y1,000 to 5,000, according to Mr. Toyoji Kaneko, Japanese Consul at Rangoon, who is quoted elsewhere. He said that Japanese residents in Burma numbered only 500 but there were about 200,000 Chinese, and the Burmese police authorities took pains to protect officials of the Japanese Consulate.

Defence in the Pacific

IN view of the importance of Guam as a stepping-stone for air services across the Pacific, it is interesting to read a Havas report from Washington dated February 26, saying: "Some observers attributed the Administration's defeat (of the Guam fortification project) to the division of efforts by partisans of the Guam base project. They stated that too much importance had been given the necessity of creating an air base at Guam for commercial routes."

Whatever the fate of the Guam fortification project may be, it seems that America does not want to lag behind other countries in the building of warships. Admiral William Leahy, Chief of Naval operations, told newspaper reporters on March 7, that if a foreign Power increased its naval strength materially, it would be necessary for the United States to increase its strength, and

announced on March 11, that the United States Navy would out-build Japan in warship strength in any naval construction race and would maintain the 5-5-3 ratio established by the Washington Conference.

On the other hand, Rear-Admiral Kanazawa, Chief of the Navy Publicity Bureau of Japan, told the press on March 9, according to a United Press dispatch from Tokyo, that:

"Japan has no intention of establishing naval parity with either the American or British fleets, although she plans to maintain naval strength sufficient to meet the largest naval force which could hypothetically be sent to the Far East.

"The Japanese Navy means to keep her naval force strong enough for defensive purposes in order to ensure a sense of security in naval defence, but not so large as to undertake offensive operations."

The allegation that Japan is fortifying the South Sea Mandated Islands was repudiated by the State Department in Washington on March 13. The Department informed the Senate Naval Affairs Committee which was debating the advisability of the Guam project that, as far as it knew, Japan had not violated the Japanese-American Treaty of February 1, 1922, which forbade military or naval fortifications on the island of Yap and other mandated islands in the Pacific.

British Activity

In the meantime, the defence by Great Britain of strategic points in the southwestern Pacific is being strengthened with considerable energy.

Garrisoning of the new fortress on Penang Island, in North Malaya, has already begun. A battery of heavy artillery and British and Indian troops have started transfer operations from Singapore. Fixed defences have been established at strategic points on the island, taking advantage of the topographical features which make it an ideal fortress.

The Netherlands, entertaining serious concern over the defence of the East Indies, have provided for an expenditure of £15,000,000 for the defence of the islands lying at the front door of Britain's £20,000,000 naval base and fortress at Singapore. Particular attention is being paid to air defence. Eighteen Dornier seaplanes for the naval air service are to be built at factories in Holland. Other Dorniers are being built in Germany, and a large number of Glen Martin bombers are being ordered from the United States. The naval squadron based on Sourabaya, Java, is also being increased, with six new 8,000 ton cruisers to be added in the near future. Other warships include a flotilla leader, eight destroyers and 12 large submarines. Powerful coast batteries have been established to protect the naval docks at Sourabaya.

The Government of French Indo-China is reported to have started the construction of fortifications in Cam Ranh Bay, believed to be as strong as Singapore. The Government announced, on February 25, the closing of Cam Ranh Bay to general shipping, except French warships. In Paris, M. Ernest Outrey, honorary Colonial Governor-General who has spent several years in Indo-China, advocated, on March 3, the fortification of the bay to deal with the threat raised by Japan's occupation of Hainan. On the next day, M. Georges Mandel, Minister of Colonies, revealed to the Senate's Colonial Committee, among other things, that Indo-China had been endowed with autonomous military organization following the development of her air force, the creation of arms manufacturing

and aircraft building plants, and the training of native technicians.

Cam Ranh Bay still remains in the memory of the Japanese people as the anchorage of the Baltic Fleet at the time of the Russo-Japanese War.

To Hold Conference

Great Britain is going to hold an Anglo-Australian-New Zealand Conference on Pacific Problems in New Zealand to consider "Pacific questions of common concern with reference to defence problems."

The Conference is likely to discuss general military, naval and aviation matters, including the training of armies, the co-ordination of naval action and the problem of airlines. Canada will be represented, for she might be able to manufacture planes not only for Great Britain, but also for the Pacific Dominions.

The Dominions Office in London issued a communique on March 12, stating: "As the result of a suggestion put forward in the middle of last year by His Majesty's Government in New Zealand and which has since been under discussion by the Governments concerned, arrangements are now completed for the meeting in New Zealand in the near future of a Conference between representatives of New Zealand, the Commonwealth of Australia and the United Kingdom, to consider Pacific questions of common concern with reference to defence questions."

Representatives of the various defence services will attend the Conference. It is understood that they will include Air Marshal Longmore, General Squires, Admiral Coloin, officers of the Singapore High Command, and other defence experts.

New Governor-General

The next Governor-General of French Indo-China will be a military man, according to reports from Saigon. General Jules Antoine Buhner, formerly Commander-in-Chief of the military forces in French Indo-China, is said to be the most likely candidate for the post.

His appointment would break the precedent of having a civilian as Governor-General. The appointment of a military man would result in hastening completion of the defence measures now occupying the attention of the colonial government.

These measures include the training and equipment of the new Annamite army of 20,000 men conscripted last year, various improvements in the defence system along the Chinese border, and closer co-operation between the army, navy and air force.

"It Can Be Done!"

'Japan Developed Taiwan and Chosen Single-handed and She Can Repeat in China if Necessary'

As Told to PERCY WHITEING

CAN Japan, single-handed, carry out her vast project of reconstructing China? and are the United States, Britain and France able to prevent her from achieving her ambition if they try to do so by economic pressure?—are two questions vitally affecting the future of Asia and the western Pacific for many years to come.

Ginjiro Fujihara, one of Japan's greatest industrial leaders, has no hesitation in declaring that Japan, by herself if necessary, can accomplish the work of establishing a new China and a new order in East Asia, and that America, Britain and France cannot effectively interfere by economic pressure.

Mr. Fujihara is one of the makers of modern industrial Japan, and his views, expressed in the course of an interview, can be taken as representing the ideas of most of the other men of the front rank in Japan's economic world. He is head of the Oji Paper Company and member of the House of Peers in the Imperial Diet. When he took charge of the Oji Paper Company 28 years ago its capital was only Y6,000,000, and its condition none too good, but to-day with a capital of Y300,000,000, it is one of the greatest organizations of its kind in the world.

Looking for proof nearest to hand of what he believes Japan can do in China, Mr. Fujihara said that, without wanting to appear boastful, he thought his own work might be taken as an example of what Japanese are capable of when they are determined to accomplish a big and difficult task.

Mr. Fujihara believes Japan could maintain her position and carry on her project in China in spite of any economic blockade that unfriendly powers might set up, because she has reached the industrial stage where she can supply enough of her own needs in vital commodities, besides which she has sufficient food to feed her population. Even in her most vulnerable point, petroleum, Japan could manage with what oil she produces aided by substitutes and supplies from friendly countries, Mr. Fujihara considers, until she sufficiently increases her own production of oil and liquefied coal and shale.

The most important underlying factor which will carry Japan successfully through all her struggles, Mr. Fujihara points out, is the human element in the Japanese national character. The "Yamato-Damashii," or spirit of the Japanese race, is what sustains them in adversity and spurs them on to attainment of their objec-

tives. This human strength and hard work compensate the Japanese for their lack of many material resources.

Mr. Fujihara takes issue with the British belief, expressed by the Prime Minister, Mr. Chamberlain, and others, that Japan cannot reconstruct China without the aid of foreign, particularly British, capital. He asserts that if Japan fosters in China the old Chinese financial system, by which currency has been supported partly by military strength, partly by able administration and partly by actual monetary resources, Japan can, by herself, successfully guide the rehabilitation of China. He would not, however, reject foreign financial aid if offered in the spirit of genuine co-operation with Japan.

Record in Taiwan and Chosen

As examples showing what Japan can do in reconstruction and development, Mr. Fujihara thinks her record in Taiwan (Formosa) and Chosen (Korea) compares very favorably with what has taken place in the British dominions, Australia, New Zealand and Canada.

He points out that in Australia the national production increased by 230 per cent to £400,000,000 between 1911 and 1935, and in New Zealand by 300 per cent to £114,000,000 between 1900 and 1936, while in Canada it declined by 30 per cent to \$4,390,000,000 between 1929 and 1934. In contrast, production in Taiwan increased by 450 per cent to Y708,000,000 between 1912 and 1936, and in Chosen by 800 per cent to Y2,230,000,000 between 1910 and 1936. Moreover, Taiwan's total foreign trade increased by 3,000 per cent to Y610,000,000 between 1896 and 1935, and Chosen's total foreign trade increased by 2,000 per cent to Y1,490,000,000 between 1910 and 1935.

Mr. Fujihara thinks these results demonstrate Japan's ability to develop the resources of backward countries, and that as she was successful in those cases she will be even more successful and more quickly so in China, which already has a basic development of her own.

He emphasized that he is not antagonistic to the use of European and American capital in the reconstruction of China, provided the Occidental financiers will work with, not against, Japan, but that on the other hand Japan will not be deterred from carrying out the work alone by economic pressure from other countries.

Mr. Fujihara called attention to British opinion that if Japan wishes a reasonably quick return on her enormous outlay in China she must have foreign financial aid, and that third-party Powers might well retaliate against what they consider Japan's measures against their rights and interests in China by striking at her foreign trade, thus undermining her economic structure, hampering her work in China, and eventually crushing her.

Nothing New

"This," said Mr. Fujihara, "reflects the view that Japan's economic structure is flimsy and that she can be crippled by economic pressure. Britain, the United States and France seem to be contemplating some such measures against Japan, according to press dispatches. The financial and economic structure of Japan is however, on a sound basis, and I wish to call the attention of Occidental observers to our success in the development of Chosen and Taiwan, which has been accomplished without introducing foreign capital."

"When Taiwan was ceded to Japan 45 years ago, the inhabitants had long been barbarous, the Chinese central government having been too feeble to make its power felt over the island. Bandits were rampant everywhere and all the mountainous districts were inaccessible on account of the ferocious aborigines. The entire region was not habitable for civilized people owing to malaria and other tropical diseases."

"Not only the Occidentals but also the Chinese wondered what the Japanese could do there, and watched Japan's work of development with curiosity. The program of clearing out the bandits was worked out by the Japanese Government by organizing the police and military forces. The bandits sought refuge in the mountains, whenever they encountered a punitive expedition. The peaceful inhabitants, who declared their allegiance to the Japanese regime, had on the other hand to let the bandits lord it over them."

"It took approximately 10 years to establish peace and order by completely wiping out the bandits. This task, as well as that of civilizing the aborigines, was far from easy, and it was extremely

difficult to stamp out diseases. It took approximately 40 years to attain the present state of development, in which there is now no trace of barbarism. In addition to combatting the bandits, aborigines and malaria, Japan has been highly successful in her program of industrial and cultural development. This is attributable to the superior administrative ability of the Japanese and their devotion to work with indomitable determination.

"The history of Japan's work in Chosen is practically along the same lines, and it is noteworthy that in both cases the task of development was accomplished without the assistance of foreign capitalists."

Plenty of Confidence

"Our successful experiences in Taiwan and Chosen are such that our government and people have unbounded confidence in the outcome of our present undertaking of rehabilitating China, which is a program of great historic significance. There is nothing that makes Japan hesitate in this work, and she will forge ahead steadily without misgiving."

"In the vast areas of Chinese territory now under Japanese occupation, Japan does not have to combat malaria, but the country is infested with bandits and remnants of defeated troops, the condition in this respect being similar to that which prevailed in Taiwan when it was ceded to Japan."

"Our experiences in the past teach us that it will be unwise to attempt rapid progress in our program of reconstruction and development in China. Hasty work is bound to bring reverses. The first step to be taken by the new Chinese regimes will be to adopt an efficient police system, which, aided by the Japanese military, is expected to suppress the bandits thoroughly. Reconstruction will be carried out step by step, commencing in the localities where peace and order have been secured."

"It is, however, realized that the vastness of the occupied area requires considerable time before any tangible result can be shown. The difference between Taiwan and China in status also will have to be taken into consideration. The former is Japanese territory pure and simple, where our own Government was at liberty to do anything in its own way when the island was taken over. The latter is not going to be annexed by Japan, as has been declared on more than one occasion by the Japanese government."

"Japan is to give guidance to the new regimes to be set up in China. By military aid Japan will co-operate with the new regimes in establishing peace and order. It is thus clear that hasty reconstruction would make the work very difficult. There is, however, another feature that makes the work in China somewhat different. Unlike Taiwan, China is a land of ancient culture, where in some localities there are cultural institutions of modern types. Generally speaking, the Chinese are by nature industrious and hardworking, and reconstruction may take less time than in Chosen and Taiwan, if the program of Japanese leadership is carried out wisely."

Comparatively Speaking

"The industrial development of Canada has been retarded under Britain, which is noted for superiority in financial resources, as well as in technical and cultural attainments. I have pointed out the slow progress shown in Australia and New Zealand. During the past 36 years, the overseas trade of the Philippines and Hawaii under the United States' administration has increased only four to five fold."

"Let me draw attention to Japan's brilliant success in Taiwan and Chosen, where the volume of foreign trade increased thirtyfold and twentyfold respectively in the course of 40 and 25 years. In the field of productive industries, the increase was fivefold and eightfold respectively."

"The unflinching enthusiasm of the Japanese in their work of reconstructing China is such that I do not think I am too optimistic in anticipating the same degree of success in China as in Chosen and Taiwan. Even if Japan accomplishes about half as much, the result would nevertheless be highly satisfactory, compared with the success achieved by Britain and the United States along similar lines. For these reasons I have unbounded confidence in the ability of the Japanese to carry out their program of reconstructing China without depending on foreign capital."

"Let me now turn to the possibility of economic pressure which is said to be contemplated by Britain, the United States and France with a view to crippling Japan's foreign trade. The

following figures will give an idea of Japan's trade relations in 1937 with Britain, the United States and France, including their overseas possessions:

BRITAIN AND DEPENDENCIES				
Exports	..	..	..	Y 839,208,000
Imports	..	..	..	1,112,113,000
Balance	..	..	..	272,905,000*

U.S.A. AND DEPENDENCIES				
Exports	..	..	..	Y 712,947,000
Imports	..	..	..	1,316,161,000
Balance	..	..	..	603,214,000*

FRANCE AND DEPENDENCIES				
Exports	..	..	..	Y 74,293,000
Imports	..	..	..	57,468,000
Balance	..	..	..	16,824,000**

Note:—(*) Excess imports into Japan. (**) Excess exports from Japan.

"It will be seen from the above figures that Japan buys more from Britain and the United States than she sells, and the reverse with France. Should the three countries resort to the step of severing trade relations with Japan, she would suffer, of course, but the losers would be Britain and the United States.

Situation Changed

"In the event of imports being stopped owing to the aggravated situation, Japan is not likely to suffer so much as some Occidentals may think. I hope they have a fairly good idea of the present state of industrial development in Japan. The situation to-day is quite different from what it was a decade or two ago.

"Years ago Japan has to depend, in a large measure, on foreign supply for arms and munitions, as well as for machinery and raw materials required for peaceful industries. The condition has changed remarkably—to such an extent that except for a few specialties, Japan is self-sufficient to-day. I would, therefore, warn against the hasty conclusion that Japan will break down if imports from Europe and America are completely interrupted.

"Of the articles imported heretofore by Japan from the three countries' raw cotton and wool are among the most important. Iron, copper, aluminum, lead, nickel, zinc, tin and various lines of machinery also may be mentioned. Except for cotton and wool, Japan's industries have reached a stage of self-sufficiency, thanks to the untiring efforts of our industrialists and scientists. Even if cotton and wool should cease to be imported, Japan has her silk to rely on, and there are numerous substitutes highly developed lately.

"The Japanese, who are resourceful by nature, know how to adapt themselves to an emergency, and have been inured to hardship for centuries. It is also very noteworthy that Japan is experiencing no shortage of foodstuffs. Nor is she likely to have any difficulty in feeding her population. It would indeed be a great mistake to liken Japan to Germany, which disastrously broke down during the World War owing to economic pressure.

"It may be asked what Japan would do in case the importation of oil is stopped. In view of the fact that rapid progress is being made in the liquefaction of coal, Japan is likely to become independent of foreign supply in the course of ten years. In the meantime she will have to keep importing foreign oil. Britain, the United States and France may possibly strike a blow at this vulnerable point of Japan.

Plenty of Substitutes

"In that case, Japan will use alcohol, charcoal gas, and other substitutes, while all possible measures for conservation will be taken to decrease oil consumption. Any actual shortage after resorting to the measures of conservation as outlined will be supplied by countries not participating in the economic pressure. Should the worst come, and this source of supply be intercepted, Japan would make up her mind to resort to a measure of self-defense. However, I do not anticipate such an eventuality.

"Let us next consider what Japan would do, should the import of Japanese goods into those countries resorting to economic pressure be prohibited. I am reminded in this connection of the

outcome of the Manchurian incident. At the earlier stage, it was China that was played upon by British and American instigation and took the lead in boycotting Japanese goods. China had previously resorted to this measure, and Japan's exports to that country had fallen from Y420,000,000 in 1926 to Y260,000,000 in 1930.

"In 1932, which was the year following the outbreak of the Manchurian incident, the amount was reduced to one half, while in 1934 it dwindled to Y117,000,000. When the Japanese are subjected to pressure in one region, they know how to expand elsewhere. The Japanese did not meekly yield to the pressure brought to bear on their China trade. They found a way out in Kwantung province, India, Dutch East Indies, Straits Settlements, etc. What was lost in China was more than made up elsewhere, and new markets were opened for Japanese goods. Comparison of the export figures for 1930 with those for 1934 shows an increase of Y334,000,000.

"If we add the figures for Manchoukuo to those quoted above, the aggregate increase amounts to Y443,000,000. In addition to making up the loss sustained in China amounting to Y143,000,000, Japan gained Y298,000,000 in her export trade. After all, the Chinese boycott of Japanese goods proved a benefit to Japan.

"Japan depends vitally on her export trade, the breakdown of which would give rise to the serious problem of unemployment. On account of the present conflict with China, the productive capacity of various industrial plants has been expanded, and labor shortage is being experienced. The demand for labor is bound to become keener in view of the situation necessitating the production of those articles imported heretofore.

Expand China Trade

"Should other powers interfere with Japan's export trade, the surplus of labor created thereby would be used for increasing the productive capacity, which is urgently needed. There would be no room for unemployment or any other social problems, while various lines of industry will make satisfactory progress. Meanwhile the new regimes which will spring up in various parts of China, will be a great help for the expansion of Japan's China trade.

"As in the case of the Chinese boycott of Japanese goods at the time of the Manchurian incident, which was instrumental in developing Japan's trade with Manchoukuo, any pressure which Britain, the United States and France may bring to bear on Japan's foreign trade, will accelerate the expansion of her China trade. What Japan loses on account of the British, American and French pressure will be more than made up in China.

"Also it should be borne in mind that the trade with other countries more friendly to Japan will show considerable progress, as after the Chinese boycott. I am looking forward to the further expansion of Japan's foreign trade, similar to that which followed the Manchurian incident.

"Apprehension is entertained by a large number of Occidentals regarding Japan's policy of financing the present emergency by means of bond issues, ranging between Y500,000,000 and Y1,000,000,000 a year. I note that it is the same skepticism that prevailed abroad during the Manchurian incident, when it was feared that Japan would break down financially.

"At that time I pointed out that the large amount of government loans floated in connection with the incident, including the program of rehabilitation and development, constituted a sound investment. My contention is that if Japan's trade with Manchoukuo increases from the work of development proving successful, it will be simply a return on the investment, and there is nothing to make us apprehensive. The present prosperity of Manchoukuo, which is a blessing to the Manchoukuoans as well as to the Japanese, demonstrates that Japan has not lost anything in the undertaking.

No Financial Fear

"An enormous amount of money is required again for the China Incident. China is a land of vaster area, and the economic rehabilitation of that country will be of corresponding magnitude. If Japan succeeds in rehabilitating China, of which we all are confident, the huge sum spent for the work will constitute a sound investment, and there is no ground whatever for fear of financial collapse.

"Those engaged in any line of business are familiar with the usual practice of preparing a balance sheet of liabilities and assets.

There would be no reason for anxiety if the two columns are adequately balanced on a sound basis. It is natural that the liabilities should increase in proportion as the assets increase. Foreign critics who fear Japan's financial structure may collapse on account of the mounting bond issues overlook the assets side of the balance sheet.

"From a practical businessman's viewpoint the China market is an asset for Japan, and there is no cause for misgiving on account of the liabilities that increase thereby. The funds are raised in Japan and the bond-holders are Japanese. Broadly speaking, the domestic loans of this nature hardly constitute indebtedness. The Japanese people are capable of managing their financial affairs arising from the loans floated among themselves. The patriotic motive in subscribing for the government bonds issued in connection with the emergency is strong in Japan.

"I have come across, in a recent issue of the *Bulletin of International News*, published by the Royal Institute of International Affairs, London, an article reviewing the cost of the present emergency. The writer gives a picture of the financial situation in Japan. In spite of the enormous State expenditure swelling the national indebtedness and the severe strain on the gold reserve of the Bank of Japan, which are reflected in various indices quoted by the writer, he has the following to say:

"Such indices are striking and important. But the significance of some of them should not be exaggerated. France's government, too, is spending over half the national income, whilst the totalitarian governments must be spending considerably more. Britain's national debt is practically double her national income. Finally, Germany lost virtually all her

gold in 1933—and proceeded to develop her foreign trade very effectively on a barter basis. If, as seems probable, Japan can avert an immediate economic and financial collapse, she will have time to benefit from her newly-acquired control of China's immense resources."

Japan's Spiritual Power

"I hope I have succeeded in showing that no economic pressure will be powerful enough to cripple Japan's foreign trade, undermining our financial structure. But may I ask if Japan really deserves retaliation at the hands of Third Powers for what she has done in China? In the numerous cases of grievances for alleged discrimination against the rights and interests of Third Powers in China, it will, of course, be necessary for the Japanese government to take all necessary steps for readjustment and restitution.

"However, it seems to me that those Powers which complain of the alleged outrages appear to forget that in China they heretofore have been behaving themselves as if they were in their own countries or colonies. The rejuvenated China is emerging from semi-colonial status, and the Western Powers will no longer be able to take too much advantage of her weakness.

"Let me," Mr. Fujihara said in conclusion, "draw again the attention of Occidental observers who still have the idea that the economic structure of Japan is a flimsy one to the fact that their fallacy is due in a large measure to their failure to appreciate the spiritual element in anything undertaken by the Japanese, who are industrious and hard-working."

British Banker Surveys Far Eastern Conditions

An interesting survey of conditions in The Far East is given in a portion of the address of Mr. T. E. Pearce, Chairman of the Hongkong and Shanghai Banking Corporation, on the occasion of the annual meeting of the corporation at Hongkong on February 25 last. He said in part . . .

For a good many years it has been the custom for your Chairman to review at some length in his speech to shareholders the political, currency and trade conditions in the Far East. This year the political situation is so delicate and the currency and trade situation so abnormal that, while making some references to each of these headings, I trust you will not be disappointed if I confine my remarks in the main to generalities and leave untouched or pass but lightly over matters about which you hoped for stronger words or more detailed observations. I am sure you realize how foolish it would be for one in my position to attempt to enlarge on subjects which at the moment are both controversial and of great political delicacy. We are, of course, not in the inner confidences of any Government, and it is obvious that the more I say the more easy will it be for misinterpretation to arise.

British Rights in China

Our balance sheet and statement of account show that in spite of all difficulties we have managed to hold our own, and the measured optimism of last year's Chairman has proved to be justified. But all of us who have a solid stake in business and trade out here are aware how precarious and changeable the financial and economic outlook must inevitably be so long as the two great neighboring Eastern countries remain antagonistic. The present conflict has also led to an unsatisfactory situation in regard to the maintenance of the "Open Door" and British rights and interests in China.

There are some who blame our Home Government for not taking a stronger line of action both here as well as in Europe. I do not, however, propose to criticize British policy. In times of international crisis freedom of speech and freedom of the press have their drawbacks, and much harm has in my opinion been done in recent times by careless criticisms, rumors and the publication of unauthenticated news items. I believe that recently there has been more controversy at home than is wise and desirable about questions of foreign relations. At any rate, it is abundantly clear that His Majesty's Government are steadily strengthening the

nation, while at the same time they are freeing their hands and thus becoming more prepared to face future events without embarrassing entanglements. Moreover, the Powers most interested in the Far East have made their stand clear: that the position of their nationals is governed by the strict observance of international obligations such as the Washington Treaties and other international agreements, the alteration of which by unilateral action will not be considered.

From the Japanese side there have also been very explicit assurances that Japan will respect to the fullest extent the rights and interests of the Powers in the occupied areas while leaving "the door wide open." Mr. Hirota used these last words on January 22, 1938, and similar statements have been repeated by important Japanese officials on numerous occasions. It is, however, impossible to reconcile such assurances with the trend of developments in North and Central China. Our important stake in the economic structure of the Far East naturally makes us very anxious that treaties, agreements and properly authenticated statements should mean what they say and be carried out with good faith.

In regard to the currency situation in China, you all know how matters stand; that, as in many other countries, the currency has more than one exchange value, the official rate and the open market rate, which varies in different parts of China owing to restrictions on the movements of bank notes. Until March the exchange was maintained satisfactorily in Shanghai, but when the Federal Reserve Bank was formed in North China and threatened to undermine the national currency, a system of exchange rationing was introduced. This resulted in operators obtaining their exchange requirements where they could and a "black market" started, which eventually became the normal open market for Shanghai, as distinct from the closely rationed official market. As allotments at the official rate became more limited, the open market rate fell away gradually. Thus the dollar was at about 10½d. in the middle of May. A month later it was down to 8d. and eventually the lowest point of 7½d. was reached early in August. Support was then forthcoming and soon after the tide turned and the rate recovered to around 8½d. Since then the rate has kept reasonably steady and there have been comparatively speaking, only slight fluctuations caused by military or political developments or local rumors. At the end of the year not only had flight from the currency ceased, but there had been a fair amount of repatriation of funds.

You can read between the lines how difficult and tense a time exchange bankers had throughout the first nine months of the year. Even now there is an ever-present fear of what I may call "external influences." The Tientsin and North China exchange market has particularly suffered from these "external influences" and the outlook there remains under this cloud.

Government Finances

War-time conditions govern the finances of the Chinese Government, but the latter have been assisted by flood crops in the Western provinces and by the fact that remittances of money from Chinese residents abroad have been remarkably well maintained. Perhaps I can sum up the currency and financial situation in China by saying that, partly through good fortune, but more through skilful management, it has been kept well in hand.

We have watched with anxiety the developments taking place in regard to the Chinese Maritime Customs Administration. Although the so-called Anglo-Japanese Customs agreement of last May has not yet been endorsed by the Chinese Government, we are satisfied that it did in fact serve a valuable purpose in aiding the Administration to pass safely through a period dangerous to its integrity. Weighty reasons have restrained the Chinese Government from putting the agreement into effect, but we are sorry that this has not been done. Apart from other things it has meant that no foreign loan quotas have been remitted from the ports under Japanese control. Moreover, we had hopes that some similar *modus operandi* might have been applied to other difficult questions of international concern. In spite of this the payments due on Customs loans were maintained without delay or hesitation throughout 1938. But early in January the Chinese Government eventually were driven to the decision that since 80 per cent. of the Customs revenue was out of their hands they could no longer bear the whole burden of finding the equivalent of some £400,000 each month to meet these loan requirements. However, no public default has yet taken place and it may still be avoided. The future of the Customs loans is bound up with the outcome of the present conflict, but we feel sure that the Chinese Government will do all they can to set matters right as we believe that the maintenance of their credit through these loans is a matter about which they take considerable pride.

Customs and Railways

Meantime, it is pleasant to be able to record that in spite of adverse circumstances the Customs service has been able to weather the storms of the past year without any breakdown in its centralized administration under one nominal authority in the person of the Inspector-General, whom we must congratulate on just having concluded ten years of outstanding service in his arduous post. Notwithstanding the varying conditions of war that have existed at one port after another, Sir Frederick Maze and his international staff of Chinese, Japanese, British and some twenty other nationalities, have throughout shown tactful judgment under unusually difficult conditions. More than ever is it of importance that the international nature of the Customs Service should be continued and that its impartiality *vis-à-vis* foreign merchants of different nationalities should be unimpaired.

I mentioned just now that at one time we had hopes of the application of some *modus operandi* such as the Customs Agreement to other difficult questions of international concern. I was thinking of the Salt Administration and the railways. When the Salt Gabelle was organized, at the time of the flotation of the Reorganization Loan, there were great hopes that this new Administration would act like the Customs Administration and, with the help of the foreign personnel, insulate the Salt Revenues, and the loans secured thereon, from local disturbances and even more serious eventualities. To a certain extent, the Salt Administration in past years succeeded in doing so, but the Chinese Government have from time to time effected changes as a result of which the foreign element has been unable to exert those neutral influences which we would have wished. The Salt Revenues of China remain of great importance and are a potential security which may be of considerable value in the eventual rehabilitation of the country, if confidence still exists in the administration.

As regards the railways, the situation naturally deteriorated as the war was prolonged. The Peking-Mukden Railway is now alone of all the Chinese Railways running fairly normally. There

is no point in speculating about the future of the other railways in which British bondholders are interested. They have all suffered severe damage and it is clear that so long as warfare continues—and there is no sign of an end—the railways will generally speaking be liable to constant attacks. The Chinese succeeded in removing a very considerable amount of rolling stock and destroyed large sections of the track and many bridges before they retired westwards. As a consequence, the Japanese have had to bring much rolling stock over from Japan and undertake a great deal of reconstruction work at heavy cost. There has been a lot of talk about the Burma Road and the Burma Railway. The completion of the former is undoubtedly a magnificent feat though its practical importance should not be over-emphasized. The railway is still in the preliminary stages and what its future will be, it is too early to foretell.

Trade Situation

The Customs Returns of Trade for 1938 are not easily comparable with those of previous years, but the export figures do indicate how successful the Chinese Government were in gradually diverting exports from the Yangtze to South China ports. Thus exports from Shanghai dropped greatly while the majority of the South China ports showed considerably increased exports. The comparison would be more striking were it not for the closure of Canton and some of the other Southern ports after the middle of October. The Tientsin figures are a considerable improvement over the previous year, mainly because of the great increase of trade with Japan. Canton and Hankow, in spite of air raids and various restrictions, enjoyed a phantom prosperity for some nine months of 1938, but the immediate outlook is gloomy for the handful of foreigners sticking it out in those places under unpleasant conditions. The re-opening of the Pearl and Yangtze Rivers to foreign shipping are naturally matters of very great importance to Canton and Hankow but Hongkong and Shanghai are also vitally affected and merchants of all nationalities are watching the situation with concern.

The general disorganization and dislocation of trade and industry in China during the past year necessitated constant adjustment to keep in line with the changing situation. May I, for instance, remind you that during the year the Japanese occupied the ports of Tsingtao, Chefoo, Weihaiwei, Amoy and Canton. They advanced up the Yangtze beyond Hankow to Yochow and for varying periods Wenchow, Foochow, Ningpo, Swatow and other Southern ports were closed for one reason or another. As a matter of fact, I believe that I am correct in saying that Shanghai, Tientsin and Chinwangtao were the only treaty ports on the China coast which were not subject either to closure or naval operations at one time or another. That shows you what merchants and shippers had to put up with. Yet this is by no means the whole story, because even when ports were open to shipping all kinds of restrictions were frequently imposed. Moreover, in the hinterland multitudinous forms of irregular taxation became prevalent, while the dangers and difficulties of transportation increased charges enormously. Yet the movement of both import and export cargo went on. This was largely due to the amazing resilience and tenacity of the Chinese farmers and traders, which enabled them, sometimes with Government help but often without, to find ways and means of moving goods in spite of the adverse conditions with which they were confronted. In fact, the volume of some important exports has been maintained at a level well up to average years. Significantly enough there has been a great increase in the export of raw cotton to Japan, from 234,000 quintals in 1937 to 964,000 quintals last year. In West China development proceeds apace and the efforts being made to improve agricultural methods and to promote the production of goods of importance to the export trade will surely prove their value in the course of time.

Support for Shanghai

Shanghai has perforce had to resign itself to the new conditions, which have outwardly changed very little during the year. In spite of its main artery, the Yangtze River, being severed, the past few months have shown a distinct improvement, both in imports and exports, over the low level of the earlier months of last year. Up there in Shanghai you have, crowded into the limits of what are regarded as the safety areas, a population which is equal to, if not greater than, the population which previous to the

hostilities lived in the three separate administrative districts of the International, the French and the Chinese Municipalities. Moreover, considerable industrial activity has developed in the western district controlled by the Shanghai Municipal Council. New cotton mills, silk filatures, paper mills and also numerous plants of the type employing only a handful of workers have sprung up, and this feature continues. These developments have caused difficult problems for the Municipal Council as well as for the utility companies. In the Japanese-controlled areas north of the Soochow creek little change is to be recorded. A few more factories have opened and a few thousands of Chinese have returned, but by and large those areas remain much the same as a year ago, and no serious attempt at reconstruction of the devastation has yet been set in hand.

Unfortunately, barely perceptible progress has been made in the negotiations affecting Shanghai and its relations with the Japanese military and naval forces, and I can only underline what your Chairman said last year, when he emphasized the importance of the Powers supporting the present Municipal Administration, pending a final settlement of the Shanghai problem in all its aspects.

Any visitor passing from China to Japan will be struck at seeing what little outward effect the war has had on the latter country. But the effects of the war are of course telling on her month by month, and the external value of the yen is now little or no higher than the Chinese dollar. Japan is, however, a well disciplined country, with a highly organized system of Government, and it would be a mistake to underestimate her lasting powers under conditions as they exist at present. Whether these conditions change or not mainly depends on external political developments. China's loosely-knit organization contrasts vividly with Japan's, but the threads of its organization are stronger than they seem; they have an elastic quality which gives but does not easily break. Too much stress ought not to be laid on any indices relating to the economic condition of either of these countries. Under modern conditions even Europe has no right to cast stones at Asia because of abnormality in regard to statistics relating to budgets, national debts, currency reserves and so forth, and in any case these are realms in which the most august authorities often make miscalculations.

Manchoukuo year by year becomes more closely knit with Japan so I will not linger except to draw attention to the new barter agreement concluded with Germany during the year, which is expected to divert more trade from other countries. Yet it is interesting that the final trade returns show that Manchoukuo took goods from the United States of a greater value than ever before: materials for war industries being presumably the explanation.

Hongkong Awaits Developments

In Hongkong we have seen fluctuating conditions throughout the year very dependent, as always, on the *entrepot* trade with China. The fall of Canton and the closure of other southern ports has of course had an adverse effect on the business community, but it has caused no panic and we are prepared to wait and see what this coming year will bring forth. Fortunately the currency

and finances of the Colony are sound, so we are in a position to face the future with confidence.

The trade and finances of the Philippine Islands showed some recession in 1938, but there is plenty of optimism about the coming year. The gold output and base metal production both grow steadily and are an increasingly important factor in the economic outlook. Supporters of the movement to bring independence to the Islands earlier than 1946 seem to have veered round in their views as a result of the conflict in China, and the report of the Joint Preparatory Committee on Philippine affairs has helped to put a seal on this agitation.

In Malaya the set-back which started in the last quarter of 1937 continued into 1938. The trade figures are far from satisfactory while banks have been overloaded with cash. Malaya, of course, depends for prosperity largely on the rubber and tin industries and in both cases 1938 saw decreases in production as well as reduced average prices. Stocks are now gradually falling, but the future depends, as always, on demand from America.

Trade in India has been dull and exports of merchandise have fallen somewhat alarmingly. A notable change took place in the exchange market when last April the Reserve Bank of India dropped its buying rate. The effect was to cause exchange to weaken and attacks on the market by speculators were only checked in December after the issue of a strongly worded communique by the Government stating their determination to maintain the existing exchange value of the rupee.

Mediation Urged

Before I end, I have one more word to say about the situation in the Far East. For many years relations between these great neighboring countries of China and Japan has been unsatisfactory, and unfortunately there are at the moment few indications of any clearing of the air. In fact, things are drifting dangerously, and the gap will grow more and more difficult to bridge unless mediation is attempted soon. For merchants of all nationalities the desirability of an early cessation of hostilities is manifest, but for millions of desperate people it is of vital importance—a matter of life and death. This is not the occasion to dilate upon the desolation existing over hundreds of square miles of territory; upon the wretched condition of millions who first by military operations and then by succeeding waves of brigandage have been pillaged and despoiled and are likely to suffer repeatedly in similar fashion until peace is once again restored. I only urge that these conditions should be kept in mind by those who are charged with the direction of national policies and that no opportunity be missed to mediate with a view both to relieving the appalling distress as well as to obtaining a situation in which China and Japan can develop naturally and peacefully to the benefit of the whole world.

I cannot conclude without referring to the excellent work of the members of the Staff of the Bank, and particularly of the Managers and Agents stationed at ports in the Far East who have had to deal with problems such as bankers elsewhere rarely, if ever, have to face. They have served us well, and I am sure you will agree that our special thanks are due to them this year.

Airlines in the East

THE present Sino-Japanese hostilities have stimulated the air-mindedness of both the Chinese and Japanese peoples. Aerial travel was regarded as a luxury to both until the outbreak of the hostilities. However, an airplane has become the only feasible way for one to travel in the interior of China or between Japan and the Asiatic Continent, if the factor of time and comfort is of any importance. It is surprising to see how air transportation has progressed in these countries within a brief period.

The Eurasia Aviation Corporation's air services radiate from Kunming to Ninghsia, Kweilin, Chungking and other points. It was reported on February 25, from Chungking, that the Corporation had formally inaugurated the service between Lanchow, capital of Kansu, and Liangchow, in Central Kansu, while another line operated by the Corporation was to be inaugurated on February 28, between Lanchow and Hsining, capital of Chinghai (Kokonor).

Significant also is the inauguration of the Chungking-London route via Kunming and Rangoon. The survey flight from Chungking to Rangoon was successfully concluded by the China National Aviation Corporation's plane, Beechcraft No. 37, which took off from Chungking at 6.40 in the morning and arrived at Rangoon at 5.00 in the afternoon, making two stops on the way. The bag of mail for London was taken on by an Imperial Airway's plane on the next day.

The first Imperial Airway's machine to enter Chinese territory left Rangoon for Kunming on March 2. It has been arranged that the Chinese plane will fly from Chungking to Rangoon, while the Imperial Airway's machine will only operate between Rangoon and Kunming.

Airlines in Chinese territory under Japanese occupation are also being extended. In addition to services already put into operation, a new line connecting Peking, Tientsin, Tsinan,

Hsuehchow, Nanking and Shanghai was opened on March 14. A Lockheed plane left Peking at 9.30 a.m. and arrived at Nanking at 1.40 p.m. and hopped off for Shanghai at 2.30 p.m.

To Encourage Aviation

Civil aviation in Japan, Manchoukuo, Mongolia and China will be much encouraged when the "Japan Air Transport Company Bill" is approved by the Diet. The main business of the company is to promote aviation activities in Japan, Manchoukuo, Mongolia and China and to give financial aid to other air services, and it will be capitalized at ¥100,000,000, of which ¥37,250,000 is to be invested by the Japanese Government.

The opening of a route between Tokyo and the South Sea Mandated Islands has already been decided upon, together with the establishment of several radio-beacon stations.

A member of the House of Representative suggested that the Government take steps to connect the route with the American transpacific line at Guam Island.

Apart from opening of new air lines, Japan's air industry is generously financed and is the beneficiary of privileges, not granted to other Japanese enterprises, thanks to two laws and a host of ordinances.

The Machine Tool Industry Law and the Aeronautical Act exempt aeroplane manufacturers from land levies and import taxes on raw materials and parts. Moreover, a number of American skilled engineers are being employed by Japanese aeroplane manufacturers.

A Lockheed industrial engineer is helping to build his company's Model 14, mentioned above in connection with the new Peking-Shanghai route and said to be the fastest transport plane in the world. Japan not only bought the design license of this model, which was used by Howard Hughes in the round-the-world record breaking flight, but 25 completed machines as well.

A Douglas representative is working at Tachikawa near Tokyo for the Showa Aircraft Corporation. The Douglas DC 2 model is one of the most widely used planes in Japan.

A Curtiss-Wright expert is giving lectures at Fukuoka before an audience of Army, Navy and civilian fliers.

Aluminium and Gold

The rapid expansion of aircraft production in Japan has brought about in its train an aluminium boom there. Great

efforts have been devoted to building up the domestic aluminium producing industry, and Japan is at present producing 18,000 tons annually, about half of her requirements. Had it not been for the sharply increased needs caused by the China affairs, the present rate of production would have nearly satisfied the demand, which was between 20,000 and 25,000 tons.

Five or six years ago Japan produced hardly any aluminium herself. In the meantime, six manufacturing companies have been established. They have a capacity of 35,000 tons at present, and if projected expansions are carried out, their capacity will be 104,000 tons annually.

The chief difficulty confronting the Japanese companies lies in getting the basic material, largely bauxite, because it must be imported from Java, India, and Johore. However, deposits were discovered in Palao, in Japan's mandated islands in the Pacific. On the other hand, it is expected that the utilization of alumina clay and rock, found in Korea, Manchoukuo and North China, will be greatly facilitated by the recent researches of Dr. Yagoro Ka'o, of the Tokyo University of Engineering Science. Japanese industrialists have an eye to the future possibility of exporting ordinary wares made from aluminium produced within Japan or Manchoukuo.

The gold production of Japan is also being pushed on with the greatest zeal. In addition to gold mining in Japan and her possessions, and Manchoukuo, it has been started in North China recently by the Manchuria Heavy Industry Corporation which has taken over the assets and liabilities of the Great Wall Gold Mining Company. With technical assistance from the Japan Mining Company, the above firm has already produced gold at Malanku along the Great Wall, in East Hopei.

The Sumitomo interests are also operating a gold mine near Malanku and the Kangte Mining Company is engaged in the same industry at Chichanku in East Hopei.

The largest Japanese gold mining company now operating in the district is the North China Gold Production company, established last April through joint investment by the Sumitomo interests and Kochu Koshi.

In Shantung Province, too, the gold mining industry promises to develop, and the Kinugawa Electric Company, Tokyo, is preparing to mine gold at Shaoyuan. It has also begun to extend its activity to Muping, Shantung.

Japan's Foreign Trade in 1938

(The Tokyo Gazette)

JAPAN'S foreign trade in 1938, including that of Japan Proper and Karafuto or Southern Saghalien, showed an import excess of only 30 million yen at the end of October. This represents a remarkable improvement over the similar total trade figure for the corresponding period of 1936 and of 1937 when the import excess rose to huge proportions. In 1938, the volume of foreign trade declined from the beginning of the year to July, causing serious apprehension among observers. However, after July it showed improvement.

Yet, the improvement in the trade balance is not a positive one brought about by increased exports, but rather is a negative one effected by decreased imports. This may be seen from the grand totals of trade figures as of the end of October when exports stood at 2,131 million yen and imports at 2,162 million yen—a decrease of about 20 per cent for exports and 35 per cent for imports in comparison with the corresponding period of the preceding year. The trade balance improvement was due to the fact that imports fell off in larger measure than exports.

The General Situation

Japan's foreign trade in 1938 was characterized by several peculiar features. Firstly, her trade with the Kwantung Leased Territory, Manchoukuo and China, which is classified as trade within the Yen bloc, continued to rise despite the general downward

trend of her foreign trade. In other words, whereas the exports destined for third Powers fell off seriously, those for the Kwantung Leased Territory, Manchoukuo and China rose favorably from the beginning of the year, totalling 924 million yen at the end of October—an increase of 279 million yen or 42 per cent over the corresponding figures of the preceding year. In imports, trade within the Yen bloc totalled 459 million yen at the end of October, showing an increase of nearly 26 per cent over the similar figures for the preceding year. Moreover, the exports to these regions rose so rapidly that the export excess for the period under review showed an increase of more than 70 per cent.

Responsible factors for this favorable trend in the export trade, coming as it did after the remarkable decline witnessed after the beginning of the China Affair in July, 1937, are the increased demand for materials of production needed in 1938 for Manchoukuo's five-year industrial development plan and the special demands to meet various needs for construction, peace preservation and military operations in China. These factors have been interwoven with speculative demands arising from anticipation of further consolidation in various control policies in Japan.

Secondly, Japan's foreign trade in 1938 was marked by a decline in transactions with the so-called third Powers, those outside of the Kwantung Leased Territory, Manchoukuo and China. That the trade with these Powers should have been extremely unfavorable is an obvious corollary to the increase in trade within the Yen bloc,

inasmuch as foreign trade as a whole declined. Japan's trade with third Powers for 1938 totalled 1,207 million yen in exports and 1,703 million yen in imports by the end of October, showing decreases of about 40 per cent and 42 per cent respectively and leaving an import excess of 496 million yen.

Thirdly, various changes were witnessed in regard to the relative proportions of different goods imported. Government control of foreign exchange and imports was strengthened after 1937 in order to make completely effective use of the capital available in view of the prevailing situation wherein the importation of war supplies and other materials needed to meet immediate requirements had to be precipitated and the importation of civilian supplies for consumption within the country and of materials for the manufacture of goods for export had to be held down. Thus, war supplies and other needed materials continued to be imported in large quantities in 1938 in increasingly larger proportions to other imports. With the exception of agricultural products, coal and fertilizers, all of these other imports declined sharply. Especially sharp was the decline in imports of cotton, wool, raw rubber and pulp, which are important materials for the manufacture of goods for export. During the first ten months of 1938, imports of these four items fell off by 778 million yen or 60 per cent as compared with the corresponding figures for 1937. This amount of decrease corresponds to 67 per cent of the total decrease witnessed in imports during the period.

Fourthly, the relative proportions among various items of exportation have also undergone some changes, which, however, are not so conspicuous as the changes in articles of importation. Notable among such changes is the fact that, while exports to third Powers generally are tending to decline, goods manufactured from native materials are gradually coming to be exported in larger proportions in comparison with goods for export which depend on imported materials. Another change has been in the gradual decline in the position of exports of miscellaneous goods, which had provided an impetus in promoting Japan's export trade in recent years.

That Japan's export trade with third Powers is in an unfavorable situation has already been stated. This situation may be made clearer by the table given below, which presents trade figures for the ten months between January and October of the past three years.

JANUARY-OCTOBER TRADE OF JAPAN (in 1,000 yen)

<i>Japan Proper and Karafuto</i>					
		<i>The Japanese Empire</i>	<i>Total</i>	<i>With Kwantung Manchoukuo and China</i>	<i>With Third Powers</i>
EXPORTS :					
1938	..	2,291,834	2,131,832	924,641	1,207,191
1937	..	2,770,963	2,649,795	645,409	2,004,386
1936	..	2,242,364	2,159,289	527,881	-1,631,408
IMPORTS :					
1938	..	2,299,994	2,162,760	459,102	1,703,658
1937	..	3,459,094	3,315,328	371,702	2,943,626
1936	..	2,395,168	2,261,116	307,703	1,953,413
IMPORT EXCESS :					
1938	..	8,160	30,928	—	496,467
1937	..	688,131	665,533	—	939,240
1936	..	152,804	101,827	—	322,005
EXPORT EXCESS :					
1938	..	—	—	465,539	—
1937	..	—	—	273,707	—
1936	..	—	—	220,178	—

Causes of the Decline

This decline in exports may be traced to several causes. Firstly, the worldwide economic depression centring around the prevailing depression in the United States has been responsible in large measure for this trend. According to an investigation on world trade by the League of Nations, the combined foreign trade of the entire world during the first eight months of 1938 showed a decrease of about 12 per cent as compared with the corresponding period of the preceding year. Among the leading Powers, the United States imported 42 per cent less than in the previous year,

while Great Britain, Germany and other countries producing materials or mainly depending upon agriculture also fared ill in foreign trade. Japan's exports to the United States had fallen off by some 42 per cent by the end of September in 1938 as compared with the corresponding period in 1937—a decrease amounting to approximately 204 million yen in value, which corresponds to as much as 42 per cent of the total decrease in Japan's export trade for the same period. At any rate, this decline in Japan's exports to the United States as well as the general downward trend of her export trade with other third Powers may be regarded as having been in no small measure due to the worldwide depression.

Secondly, other causes peculiar to this country have existed, as may be seen from the percentage of Japan's export trade against the combined world trade, which averaged only 3.32 per cent during the first eight months of 1938 against 3.52 per cent for the corresponding period of the preceding year (If Japan's exports to third Powers alone are to be considered, the percentage fell from 2.86 per cent to 1.94 per cent). Further, by the end of September, 1938, Japan's export trade with third Powers fell off by as much as 40 per cent, while the combined world trade declined only by 12 per cent. These figures obviously indicate that there have been some causes peculiar to this country for the recent unfavorable trend in Japan's foreign trade.

Notable among such peculiar causes is the control on foreign exchange and import trade, which has been tightened to such an extent as to make it difficult to import materials for the manufacture of goods for export, thereby making Japan's commodity prices comparatively higher than in many other countries. The boycotting of Japanese goods, which has been carried on vigorously by Chinese residents abroad, may also be considered a contributing factor here. On account of the above-mentioned difficulty in obtaining materials for the manufacture of export goods, the export trade in cotton yarn and fabrics, rayon yarn and fabrics, hosiery goods and woollen textiles, which depend largely on imported cotton, wool, pulp and such fibrous materials, declined by about 30 per cent. These exports to third Powers actually fell off by more than 40 per cent, although those to the Kwantung Leased Territory, Manchoukuo and China rose by about 21 per cent during the first nine months of 1938 as compared with the corresponding period of the preceding year. This downward trend, which was less sharp during the early part of 1938 as there were previous contracts outstanding, became acute in May and the percentage of decline stood at about 46 per cent in the combined exports and about 58 per cent in those to third Powers for the month of July as compared with the same month in 1937.

Meanwhile, exports to third Powers of raw silk, silk fabrics, tinned and bottled provisions and ceramic goods, which are home products not affected by the restrictions on imports, fell off only by 22 per cent during the first nine months of 1938 as compared with the corresponding period of 1937. It may also be pointed out that the decline in the exportation of goods manufactured from imported materials was made sharper than it might otherwise have been by such additional obstacles as the complicated procedures required for imports, the lack of smoothness in the distribution of imported materials and the conversion of some of the materials imported for the manufacture of exports to uses as materials for goods to meet domestic demands.

As regards commodity prices in Japan, investigation by the Department of Commerce and Industry reveals that wholesale prices according to the September indices for 1938 rose by a little more than ten per cent over the corresponding period of the preceding year, those for staple goods for import and export rising by six per cent and a little over ten per cent respectively during the same interval. This trend presents a notable contrast to the wholesale prices in Great Britain and the United States, where commodity prices have continued to decline since March, 1937, with the result that Japan's wholesale prices have become considerably higher as compared with those in Great Britain and the United States, the upward trend of prices in Japan being more acute as regards goods for consumption than as regards materials for production, and consequently as regards goods for export than as regards imported articles.

As for the boycotting of Japanese goods, its effect was felt most seriously in the South Seas region where Chinese residents are numerous. Due to the boycotting, coupled with the business depression prevailing there, Japan's exports to these regions dwindled by about 56 per cent during the January-September

months of 1938 as compared with the corresponding period of 1937. Boycotting of Japanese goods is also under way in some parts of the United States, Great Britain, etc., instead of being confined to the abovementioned regions.

Moreover, these factors, which have combined to hamper Japan's foreign trade, have been, it may be conceded, further interwoven with other circumstances such as the hesitation on the part of overseas buyers of Japanese goods due to their anticipation of a lower yen in the future or their insufficient knowledge of financial and industrial conditions in this country, the insufficient supply of labor for manufacturing industries for export on account of the absorption of labor by munitions industries and other so-called "boom industries," and the lack of smoothness in the dispensation of shipping bottoms.

Counter-Measures

With the general situation of Japan's foreign trade as outlined above, the Government is taking various special measures to meet immediate requirements in addition to the facilities previously provided for the purpose of promoting export trade. The wartime trade policy is aimed not so much at balancing the nation's international receipts and payments in a negative way as at increasing the power to import to the maximum while balancing international receipts and payments in a positive way by maintaining and promoting export trade. Such wartime measures are summarized below.

Firstly, procedures to be gone through in obtaining import licences have been unified with the object of facilitating and speeding up procedures required for the importation of raw materials. For this purpose, a portion of the Foreign Exchange Bureau of the Department of Finance has been moved into the Department of Commerce and Industry building in order to keep the two Departments in closer contact than heretofore in co-ordinating procedures of granting foreign exchange licences and import licences. Further, the regulations governing import licences have been so revised as to simplify necessary formalities.

Secondly, efforts have been made to prevent conversion of raw materials imported for the manufacture of exports to domestic uses. For this purpose what is known as the link system was adopted. This system was first introduced some time ago when it was so arranged that an import licence be given for the importation of the same volume of wool as was contained in the woollen goods exported, the wool imported under this system being required to be exported again as woollen goods within a fixed space of time. This measure was primarily designed to encourage export of woollen goods. Later, with or without slight alterations, this system has been applied to cotton goods, rayon goods, brushes, manila paper and toilet soap. Another measure taken for the same purpose is known as the bonded factory system, under which system bonded factories may obtain import licences with special facility in case they desire to import materials with the object of reshipping them for export as manufactured goods.

Still another measure calculated to meet the same purpose was the creation of the foreign exchange fund, which was founded by earmarking 300 million yen out of the 800 million yen specie reserve of the Bank of Japan with a view to facilitating the financing of capital needed for the importation of raw materials for the manufacture of export goods. This fund has been made available for cases where adequate precautions are taken through the link system, the bonded factory system and other measures to prevent the conversion of imported materials to domestic uses. The issuance of what is known as "allowances" of raw materials for the manufacture of miscellaneous goods for export may also deserve cursory mention. Raw materials for miscellaneous goods for export have become the most difficult to obtain owing to the strengthened restrictions on imports, but in view of the important part these goods have been playing in Japan's foreign trade, special discretion has been shown in the procedures of exchange control in favor of the importation of raw materials for the manufacture of such goods for export. In a similar manner, special attention has been paid to the effective distribution of such materials after investigating into the industrial requirements of the prefectures interested with the aid of the prefectural authorities concerned and the Department of Commerce and Industry, in an effort to make the "allowances" of raw materials for miscellaneous goods for export as satisfactory as possible.

Further improvement is now being planned so that nothing may be left undone as regards the importation of materials for the manufacture of export goods.

Thirdly, attention is called to the rectification of high commodity prices. Any measure calculated directly to lower the prices of export goods would be open to criticism from abroad as a recourse to dumping. Therefore, efforts are being made to control general commodity prices in this country through the enforcement of regulations governing sales prices and other measures that may be deemed necessary in controlling commodity prices.

Fourthly, the existing "export compensation system" has been enlarged in scope so that the same system may be applied to goods for export to all parts of the world market and the compensation premiums be lowered, with a view to facilitating the financing of foreign trade. At the same time, it has been arranged that what is to be known as the system of compensating losses of loans advanced on exports will be newly introduced in order to improve trade finances.

Fifthly, remedial measures have to be taken, apart from those to be worked out through diplomatic channels, in order to remove the economic pressure which has been brought to bear on Japanese goods in overseas markets. For this purpose close contact is being maintained within the various quarters concerned so as to make Government aid available for Japanese merchants in regions where Chinese residents are thriving in business and to rectify mistaken views of the Japanese situation on the part of overseas buyers with the aid of trade information agencies and other private organizations in markets where feelings unfavorable to Japan prevail or knowledge of the Japanese financial conditions is lacking.

Sixthly, exports to the Kwantung Leased Territory, Manchoukuo and China are being controlled in order not to exceed the volumes actually needed in those countries. This control is being effected through enforcement of official regulations, control of distribution and other measures, with a view to increasing the exportation to third Powers of goods manufactured out of imported materials so as to amplify the nation's power to buy from third Powers, inasmuch as the exports to the "Yen-bloc" countries rose amazingly during 1938.

Moreover, foreign trade among the same group of countries has to be restored to normalcy as speedily as possible. For this purpose, it is necessary to expedite operations for the development of their natural resources and promote the importation of materials from these resources into Japan. Hence, the problem of controlling exports to the "Yen-bloc" countries will have to be considered in conjunction with the question of how to promote import trade with these countries.

In the seventh place, other measures are being taken with the object of generally improving foreign trade. The most notable among such efforts is the organization of missions tasked with investigation of overseas markets. These groups have been sent to various parts of the world since 1937, when five of the missions toured the Near East, East Africa, West Africa and South America. The information brought back by these missions having proved considerably serviceable for the purpose of formulating Japan's future trade policy towards these parts of the world, three more similar missions were sent to India, Central America and North America respectively in September, 1938.

Another measure taken for similar purposes calls for the opening of trade facilities bureaus abroad, which were opened at 14 places in foreign countries during 1937. The number of these offices were increased by 12 during 1938 in order to make this system more widely available throughout the world.

The measures outlined above are calculated to meet the urgent requirements of the prevailing situation. Yet it is not anticipated that they will bring immediate results in trade statistics. The Government is fully prepared to take further measures in order to improve the export of Japanese goods. It will keep in close touch with the existing industrial machinery for this purpose, for it in no way regards its own measures as a panacea for Japan's foreign trade. The expected stimulation of exports will play an important part in increasing Japan's power to buy from abroad and in making it possible for the nation's wartime economy to operate smoothly. Upon the life of the people, the importance of Japan's foreign trade is not so apparent. Economic conditions within the country have remained stable for the past several years. The Government's attention to matters of foreign trade is a part of its general concern for the development of all phases of national economy and national strength.

Resources Awaiting Development in China

"JAPAN now ranks among the 'have' countries." This statement was made by a German resident in Tokyo when problems of economic development in North China came up following the spectacular activities of the Nippon forces in defeating the anti-Japanese elements there. There is much truth in what the German said.

This term "have" and "have not" as applied to a country has been popularized since Germany some years ago demanded the return of her former colonial possessions. The United States, Great Britain, France and the Netherlands are called the representative "have" countries, while Germany, Italy and Japan are regarded as the representative "have not" countries. The definition of "have" and "have not" countries is not clear. It is understood, however, that the terms generally apply to countries favored with, or not favored with, land and natural resources.

Germany, Italy and Japan, for instance, must import from foreign countries the staple products that are indispensable for national existence, such as raw cotton, wool, petroleum, iron ores, and so on. Such imports reach a large figure. Japan imports from ¥800-million to ¥900-million worth of raw cotton annually.

As for the suppliers: The United States, British India, Australia, Canada, and Egypt export raw cotton; Australia, New Zealand, and Union of South Africa export wool; British Malaya and Australia export iron ores; the United States, Canada, and Australia are world representative wheat supplying countries; and the United States and Britain supply petroleum.

On the other hand, Germany, Italy and Japan must buy these key commodities from "have" countries.

Advantages of Colonies

As to colonies, there are two advantages in having them. One is that the owner-country can at any time obtain raw materials from these colonies, e.g., the United Kingdom gets wool, raw cotton, wheat, and iron ores from Canada, Australia, British India, and the Union of South Africa with no restrictions. The other advantage is that the market for industrial manufactures of the mother country is always secured, e.g., the United Kingdom, in order to sell her own cotton goods to Australia and British India, has enforced restrictions on the import by these states of cotton goods made in Japan.

If Japan were to free herself from the yoke of such restrictions, she must find a colony within her sphere of influence. Germany, Italy and Japan do not have such colonies.

The world trend to-day is that these "have not" countries are demanding that the "have" countries keep the doors of their colonies wide open so that the former may share the latter's advantages in obtaining raw materials and also in marketing industrial manufactures.

This demand is the basis of the world uncertainty to-day.

Equalization Movement

The Italian annexation of Ethiopia and the Germany's *anschluss* of Austria and her recovery of the Sudeten districts have been carried out by way of materializing the equalization movement between the "have" and "have not" countries. This movement, while it is progressing, is making such slow progress that it will be some time before the "have not" countries can be satisfied.

Meanwhile the British construction of a great naval base at Singapore and the Dutch reinforcement of the air forces in the Dutch East Indies are nothing but a gesture to check the advantage of such a movement by Japan.

As far as Japan is concerned, however, the outbreak of the hostilities in China brought the situation to a head. Japan is about to cease being a "have not" country.

The fall of Canton and the Wuhan cities has decided the war situation. The Chiang regime may put up protracted resistance, but it can no longer have any serious effect on the general outlook. Japan has entered a period of continental management. There will be more military operations in China, dealing with the defeated

anti-Japanese remnants who may take recourse to partisan maneuvers. But major engagements are viewed by some as over.

Open the map of China and just imagine that a vast territory of Central and South China, situated east of the railways that connect Canton, Changsha, Hankow and Chengchow, has become Japan's sphere of influence. Imagine, again, that a still larger areas inclusive of North China and Mongolia now constitute the objective of Japan's continental management. Meanwhile, Manchoukuo is making a healthy growth along the line of the Japan-Manchoukuo bloc.

Japan is no longer a "have not" country. On the contrary, Japan will have more than she needs.

The "existence," nevertheless, is not yet the "value." Value is created when the content is examined, recognized, and made to serve the purpose of the country.

Let us examine what Japan has come to control.

What Japan Wants

Where industrial resources are concerned, Japan has hitherto suffered from an acute shortage of raw cotton, wool, petroleum, iron ore, pulp, coal industrial salt, tungsten, molybdenum, antimony, manganese, aluminum, nickel, tin, lead, rubber, hides and leather, etc.

Japan's concern, therefore, is to obtain these key materials. In other words, question is how and to what extent the new order in China, arising from the present campaign, side by side with Manchoukuo, will satisfy Japan's needs. This matter will now be surveyed by items, according to individual materials, beginning with iron.

IRON.—According to the Japan-Manchoukuo productive capacity increase program, the annual output within the Japan-Manchu economic bloc is to be increased to 11 million tons by the end of 1941. This program requires a supply of iron ore amounting to about 23 million tons.

Japan has hitherto imported iron ore from mines along the Yangtze valley in Central China, Jehol, Malaya and Australia. Under the recent pressing need of productive expansion, using iron and steel, however, it has become urgent to assure an abundant supply of iron ore.

The iron ore deposits in five North China provinces are estimated at 148 million tons. Those in seven Central China provinces are estimated at 112 million tons, and those in South China, including Kuangtung and Fukien, at 34 million tons. All told, the iron ores deposits in China are estimated to aggregate 323 million tons.

Of the iron ore deposits, the Lungyen mine in North China and the Tayeh and other mines along the Yangtze valley are to be utilized by Japan as a start.

It is proposed that the Lungyen mine should be operated to yield about 3,000,000 tons of ore a year, supply Japan to the extent of 2,000,000 tons of this total. From the Yangtze valley districts, Japan proposes to obtain about 5,000,000 tons of iron ore.

Other iron mines in other districts will also eventually be operated, as surveying progresses and as peace and order are definitely restored.

Of the bloc program on iron supply, Manchoukuo is to turn out from 4,600,000 to 4,700,000 tons a year. In sequence to the recent progress of the survey in the Tungpien district Manchoukuo, mines in which the estimated deposits of iron ore reach more than 100 million tons have been discovered in the Talitse and Mishan districts, proving that the iron resources in Manchoukuo are remarkably rich. The known resources of iron ore in Manchoukuo alone aggregate more than 1,000,000,000 tons.

Meanwhile the Mozan mine in Chosen is estimated to contain deposits amounting to more than 400 million tons, although the ore is not rich in iron content (The Mozan mine is being operated by Mitsubishi and the Nippon Seitetsu, Ltd.).

As far as iron resources are concerned, Japan under the new order will no longer suffer from supply shortage.

COAL.—Japan's annual consumption of coal now amounts to about 45 million tons, with indications of its recording further

increases with the development of heavy industries. Compared with Germany and the United Kingdom, the Japanese consumption is only about one quarter of the volume.

If the volume of coal consumption were to be taken as a criterion of the progress of civilization, Japan must use four times as much as the present volume to become a first class nation. Nevertheless Japan is richly favored with hydro-electrical resources to compensate for the small volume of coal consumed.

But even if Japan were to consume four times as much coal as at present, there will be no need of apprehension regarding the supply. The coal deposits within Japan Proper are estimated at 8,000,000,000 tons and those in Manchoukuo at 13,000,000,000 tons while the estimates for China reach the astronomical figure of 320,000,000,000 tons.

It is estimated that in Shansi province alone the coal deposits reach 120,000,000,000 tons. The Tatung coal fields, for instance, are said to contain from 50,000,000,000 to 60,000,000,000 tons, the coal vein extending to the provincial border of Shensi, going underneath the Yellow River. The areas of the Tatung coal fields marked to be actually operated alone are estimated to contain 12,000,000,000 tons.

But not so much is required. Where coal is concerned, the supply is more than sufficient.

RAW COTTON.—The annual output of raw cotton in North China amounts to 5,100,000 piculs, and that along the Yangtze valley amounts to 5,500,000 piculs, the total being 10,600,000 piculs.

Chinese raw cotton is not of first class quality, but it is considered feasible to improve it and also to double the volume. Plans are under way to increase the raw cotton production in North China to 10 million piculs a year.

Japan imported 13,700,000 piculs of raw cotton during 1937. The prospects are that Japan will seek the bulk of her supply in China instead of in the United States and British India. It is consequently urgent to materialize such a situation as soon as possible.

INDUSTRIAL SALT.—The demand for industrial salt in Japan has increased by leaps and bounds in recent years as a result of the abrupt development of the soda industry. The annual consumption now amounts to 2,500,000 tons. The supply in Japan Proper, however, is limited to about 600,000 tons. Japan gets salt from Taiwan, the Kuantung Leased Territory, and Tsingtao. But the volume is not sufficient. Japan must therefore import from 700,000 to 800,000 tons of salt from the Mediterranean coast.

Plans are under way, however, to increase the production of salt at Changlu and Shantung in North China. When the present project is realized, the supply will be more than enough to satisfy the Japanese need. A surplus can even be exported.

WOOL.—It is estimated that about 30 million sheep and goats are being kept in North China and about ¥14 million worth of wool is being exported annually. In Manchuria, about 3,000,000 sheep are being raised. These sheep do not yield a high grade of wool at present. Plans are therefore under way to improve the kind of sheep as well as to increase their number. If the supply is increased, and the technique to utilize the supply of Chinese and Manchurian wool is further improved, the industry will prove of considerable value to Japan.

PULP.—Japan can hardly expect to obtain sufficient wood in China to serve as the material for manufacturing pulp. In North and East Manchuria, however, there are extensive forests as well as soya-bean stalks and reed which can be utilized to produce pulp.

The present demand for pulp in Japan is about 1,700,000 tons, of which 400,000 tons can be supplied by Manchuria. The remainder can almost be obtained by increasing the production in Japan.

PETROLEUM.—Japan needs 4,000,000 tons of petroleum of which the domestic supply can hardly satisfy 10 per cent.

In Shensi province, North China, however, there are reported to be rich oil fields. According to a survey made by engineers of the Standard Oil Co., the deposits are sufficient to supply the whole world for 300 years.

The Chu-Nichi Jitsugyo (China-Japan Industry Co.) of Japan in 1918 dispatched a party of surveyors to Shensi province with permission of the Chinese government, but the party could not complete the survey due to a civil war.

No accurate figures are known as to the oil deposits of the Shensi fields. It is known, however, that China had once operated the fields. It is also reported that a prospective drill made in 1929 struck a vein, resulting in the gush of 20,000 kin of gas daily. This attracted much attention.

When peace and order are restored in Shensi province and Japan is given an opportunity to survey the fields, there is a possibility of such investigations resulting in a more than satisfactory solution of Japan's petroleum problems.

It is said that Szechuen province is also rich in petroleum resources. According to an investigation made by the Standard Oil Co., the oil deposits in Szechuen oil fields are so immense that some astronomical figures were reported. At present, the oil fields are being operated on a small scale, but not much development is being made because of the lack of transportation facilities, financial limitations, and the absence of adequate equipment.

Recently an oil field was discovered in Chinchow province in Manchoukuo. A survey made by experts has proved that the neighboring districts are very promising. It is said that the rock formation of the Chinchow oil field is identical with that of Mexico.

The Manchoukuo government is now operating the oil field of Jalainor in North Manchuria. According to a survey made by the method perfected by Dr. Matsuyama of the Kyoto Imperial University, the prospects are said to hold much promise.

Liquefaction of Coal

Japan has given up the hope of replenishing her oil supply at home with natural production, and efforts have been made to increase the output by coal liquefaction. Nevertheless, the Japanese oil problem may yet be solved without taking recourse to such a method.

Meanwhile the coal liquefaction industry of Japan is making good progress. The South Manchuria Railway Co.'s research work, which has been conducted on a 10-year program, has proved so satisfactory that a new factory at Fushun began operations on October 1, 1938. The cost of production is said to be relatively low.

In addition, the coal liquefaction factory in Chosen, run by Jun Noguchi, has been completed, and the Mitsui interests are building a factory at Chinchow.

GOLD.—An extensive alluvial gold belt was recently discovered along the Amur River zone in North Manchuria. It is said that the area is so wide that from 10 to 15 dredges can be operated there simultaneously.

The gold mines in Jehol, as well as those in East Hopei and Shantung provinces, are to be put in operation as soon as preparations are completed.

There are also gold mines in such provinces as Shansi, Szechuen, Kansu, Hsinking and Hunan.

FOR SPECIAL STEEL.—Such metals as tungsten, molybdenum, manganese, antimony, tin and lead, which are necessary in the manufacture of special steel, are produced in wide areas in China, including Hopei, Hunan, Kiangsu, Chekiang, Kiangsi and Kuangtung provinces.

Among other metals, the Chinese supply of tungsten is the largest in the world. Germany obtains about half her total need in China.

RUBBER.—Nothing can be done about increasing the rubber supply in Japan even when the new order of East Asia is established. Japan now imports rubber from the South Seas countries.

Recently research work was completed to produce synthetic rubber from carbide, on the condition that electric power is supplied at a low cost. Carbide is obtained from coal and limestone. When power and coal can be supplied at a low cost, much of the rubber problem can be solved.

With such facts in view, plans are under way to generate cheap hydro-electric power, utilizing the water resources of the Yalu River and Sungari River and the cheap coal of eastern Manchuria. Marshal Hermann Goering of Germany has said that he could make Germany self-sufficient in rubber if he could obtain coal and limestone, but in Germany, where the water resources are not rich, electric power is generated mainly by burning coal. Japan is rich in hydro-electric power supply, signifying a marked advantage over Germany.

It is surmized that problems concerning the rubber supply in Japan may soon be solved.

MARITIME PRODUCTS.—There is no national boundary in the ocean. Consequently, there is no such an issue as import restrictions and boycotts. The ocean is indeed the greatest industrial resource for Japan.

To carry on salmon and crab fishing along the Russian sea-coast in the northern sea, Japan has had considerable trouble with Soviet

(Continued on page 105)

Electric Machinery Manufacturing in Japan

THE telegraph instruments brought by Commodore Perry in 1854 and presented to the military ruler at Yedo, the former name of Tokyo, were the first electrical communication instruments ever imported into Japan. Afterwards, the Breguet's indicator and the Morse ink printer were imported in 1869 and 1871, respectively. In 1873, a copy of the latter machine was made by the Machinery Bureau of the Industry Ministry, making the genesis of electric machinery manufacturing in the country.

About 1879, many private firms, which were primarily engaged in the repair of electric machinery, began to manufacture telegraph instruments, and their business has since grown apace in parallel with the development of Government telegraph enterprises. Technical research during the following four decades made it possible to produce automatic telegraph equipment in 1919 and other instruments in succeeding years, making the telegraph industry completely independent of foreign electric machinery makers.

In 1936, the public telegraph service under the State management operated 5,103 simplex sounders, 743 duplex sounders and 4,716 telephones for repeating telegraph messages, in addition to a considerable number of A.C. and D.C. quadruplex sounders, automatic duplex recorders, automatic Roman-letter printers, two-way Roman-letter printers and picture transmission apparatus. Particularly notable is the "N.E." picture transmission system designed by Dr. Yasujiro Niwa and Mr. Masuji Hayashi, engineers of the Nippon Electric Company, which was used for the transmission of pictures of the Berlin Olympic Games to Tokyo over a distance of 9,000 km. with far better results than those sent by the machine in Germany, where the invention originated.

Wireless telegraphy was studied and experiments made by the Ministry of Communications as early as 1896. The instruments manufactured in the shops of the Ministry, where various telegraph apparatus and light-house supplies were produced at that time, were used by the Imperial Navy. Some of the instruments, displayed in the industrial exposition held in Osaka in 1903 drew great attention of the visitors. The wireless telegraph has been widely applied in practical service since the crystal detector was invented in 1907 and instantaneous spark detector was imported in 1912.

Imported machinery is seldom used in wireless telegraphic communications in Japan. Local makers now supply the entire list of equipment, not only the special design for Government use, but also all kinds of transmission and receiving instruments for long or short wave-lengths and their accessories for ships, airplanes, international communications, etc.

Radio broadcasting equipments were not imported except those used in the first station which was put into service in 1924, and all other stations are equipped with Japanese machinery throughout. The 150 kw. broadcasting plants completed in 1936 illustrate the recent technical progress in this branch of electrical engineering. The 50 kw. short wave equipment is the most highly improved in the world. Television is being studied by the Electro-Technical Laboratory of the Communications Ministry, Waseda University, the Hamamatsu Higher Technical School, the Japan Broadcasting Association, the Tokyo Electric Company and other institutions. They have already experimentally transmitted and received images, and television broadcasting is scheduled to be inaugurated in the immediate future.

The telephone was first imported in 1877, the year following its invention by Alexander Bell. These first instruments were studied in the telegraphic machinery works of the Ministry of Industry, which began to produce them in 1878, and Edison's carbon telephones in 1883. Since that time, various types of telephones have been imported from many countries, and a comparative study has resulted in the development of many different types of Japanese telephones, exchangers and other accessories, which were employed in the first interurban telephone service between Tokyo and Yokohama inaugurated in 1890.

Private manufacturers entered this field in about 1880, when the first carbon telephone set produced in this country was exhibited in the industrial exposition held in Osaka in 1881.

The manufacture of telephone instruments was a Government undertaking in the beginning, or until 1896 when 1,580 telephone sets and series multiple type exchangers of private makers were acquired for the State telephone service. The engineering advance has since been very rapid. In 1903 parallel multiple exchangers were produced for the first time, while in 1907 common-battery exchangers and parallel multiple system with indicating lamps were produced. As a result, the industry has become entirely self-sufficient in a quarter century.

The first automatic telephone exchange was set up in 1922 when the Communications Ministry installed one set of Strowger system with a Keith line-switch for its own internal communications. This system has since been investigated by many electrical makers,

and has been adopted in Tokyo, Osaka and other big cities throughout the country. These makers are now producing Siemens and Strowger automatic instruments at lower cost and with great technical skill. These have completely replaced imported machine since 1930.

Japanese makers now produce all types of telephones, including desk and

wall sets, selective calling sets with dials, portable sets, etc., besides a remarkable set with special carbon grains in the transmitter and loud speaker, by which conversations may be carried on from a distance of several feet without the use of an amplifier.

Carrier current telephones, though imported only for experimental purposes until about ten years ago, are produced here at present. Some of them are capable of carrying three or more conversations simultaneously.

As outlined in the foregoing, Japanese telegraph and telephone makers supply the entire domestic demand and, at the same time, export an increasing quantity every year, totalling ¥5,560,000 in 1936.

Prime Movers

The first water turbine to be built in Japan was completed in 1892, and the unit capacity of this prime mover was increased to 200 kw. in 1903. But engineering progress in general had been insignificant until the World War, when it suddenly became imperative to produce within the country the bulk of Japan's machinery needs. As a result, there were epoch-making strides in the manufacture of power generating plants. Japanese electric machinery makers, undaunted by the sluggish business that followed the War, have constantly worked to improve their technique, and now are capable of producing various prime movers of more remarkable capacity and performance and at more attractive prices than foreign makers.



Factory and Laboratory of The Tokyo Electric Co., Ltd.

In 1917, some of them built a larger water turbine, with a rating of 10,000 b.h.p. and, moreover, designed a vertical machine, which was regarded as a great engineering difficulty in those days. The unit capacity of the vertical turbine has since been steadily increased, namely, to 14,000 b.h.p. in 1924, 22,000 b.h.p. in 1928, and 31,000 b.h.p. in 1930. And the machine installed in the Shinanogawa Water Plant of the Railway Ministry, capable of developing 60,000 b.h.p., is the largest in capacity in the Orient and apparently one of the largest in the world. It is made of Japanese materials throughout. It should be remembered that a Pelton turbine, rated at 18,650 b.h.p., was produced in 1928.

Also very striking has been the technical advance in the manufacture of propeller turbines. All the machines so far built, including one of 2,000 b.h.p. produced in 1930 and another of 5,200 b.h.p. put in service in 1936, are operating with the efficiency for which they were originally designed.

It was in 1907 that the first steam turbine was built in this country. Since that time, there has been tangible progress in the design and manufacture of steam turbines of all types for land and marine installation. Engineering skill in this line took a long step forward during and after the World War.

In the field of boilers, the Babcock & Wilcox, Heine and others under foreign patents have long been produced in this country, and the Takuma boilers, designed by Mr. Tsunekichi Takuma, an outstanding Japanese inventor, have been rapidly adding to their importance in steam power generation.

A reaction turbine of 12,500 kw. capacity was built in 1917, and many of prominent foreign design, such as the Stal, Zoelly, Metropolitan Vickers A.E.G. and some others, have been produced in this country establishing records in respect to size, capacity, speed, etc. One turbine already built has the record capacity of 75,000 kw., and another a capacity of 50,000 kw., and speed of 3,000 r.p.m. Since 1921, there has been a considerable increase in the steam pressure and temperature in use, and many power plants now operate at working pressures from 35 to 45 kg. per sq. cm. and at temperatures from 425 to 450 deg. C. Both the pressure and temperature will advance to higher standards in the future, undoubtedly to 100 kg. and 480 deg. or higher.

Electric Power Machinery

The manufacture of electric power machinery began a little later than the manufacture of electrical communication instruments,



Tsurumi Works of The Shibaura Engineering Works, Ltd.

particularly in 1884 or thereabout when an Edison generator was designed by Mr. Ichisuke Fujioka, then a professor at the Imperial University of Engineering, and fabricated under his supervision by the Miyoshi Electric Machinery Company. The establishment of the Tokyo Light Company as a power distributor about that time served as a great incentive to the manufacture and repair of electric power machinery and instruments in general.

Taking advantage of the increasing use of single-phase alternating generators from 1892, Hopkinson generators of 2,000-volt and 15 A. 30 kw. capacity, were produced, and transformers made in Japan were also placed on the market. Even in this earlier period, it was strongly urged that Japan-made machinery should be used for the electric power industry.

This public demand was responded to, perhaps first of all, by the Ashio Copper Refining Plants, a metallurgical enterprise of the Furukawa interests, which set up shops at Ashio, near Nikko, where electric power machinery for its own use was repaired and manufactured. As early as 1893, these plants had already built 500-volt direct current generators and motors and adopted them successfully to electric cars, winding machines, pumps and other mining machinery.

When the Tokyo Electric Light Company built a collective steam power plant at Asakusa, Tokyo, in 1895, four units of 200-kilowatts alternating generators, undoubtedly the first large-capacity generators ever produced in this country, were designed by Professor Ichisuke Fujioka, then chief engineer of that company, and Professor Nakano of the Imperial University of Engineering, and built by the Ishikawajima Shipbuilding Company, Tokyo. This was a remarkable engineering achievement for that time when it was technically difficult to build generators of more than 100 kw. capacity even in the United States.

Engineering strides in the following years made it possible to build three-phase alternating equipment and large-capacity transformers, and it was in 1903 that a transformer rated at 60,000-volts was built for testing purpose.

The industrial boom that came as a sequel to the Russo-Japanese War of 1904-05 created a great demand for electric motors and transformers, and brought about a phenomenal advance of construction technique in general. As a result, a testing transformer of 200,000-volts capacity was built in 1908, another large transformer of the single-phase oil-filled type rated at 1,500 kva. and 44,000-volts in 1910, and a three-phase alternating generator of 6,250 kva. capacity in 1913.

The World War, not only because of the virtual ban on electric machinery imports which it imposed, but also because



Head Office and Factory of The Nippon Denchi Co., Ltd.



Factory of Kawakita Denki K.K.

of its great stimulus to export trade, played a still larger part in advancing electric manufacturing technique and augmenting production facilities in Japan, bringing this industry fully to the level of the leading engineering countries in Europe and America. On the other hand, arrangements were concluded to exchange patent rights and information regarding technique with foreign makers.

The technical gains in the following years may well be judged by the fact that, for water power generation, a 8,000 kva. horizontal generator was produced in 1923 and a 10,000 kva. vertical machine in 1926, that the capacity was increased to 13,500 kva. in 1928 and to 23,000 kva. in 1930 and even to 105,000 kva. in 1938; and that, for steam power generation, generators capable of 62,500 and 93,250 kva. have been designed and manufactured during the past few years, establishing records in respect to capacity, performance and constructional features.

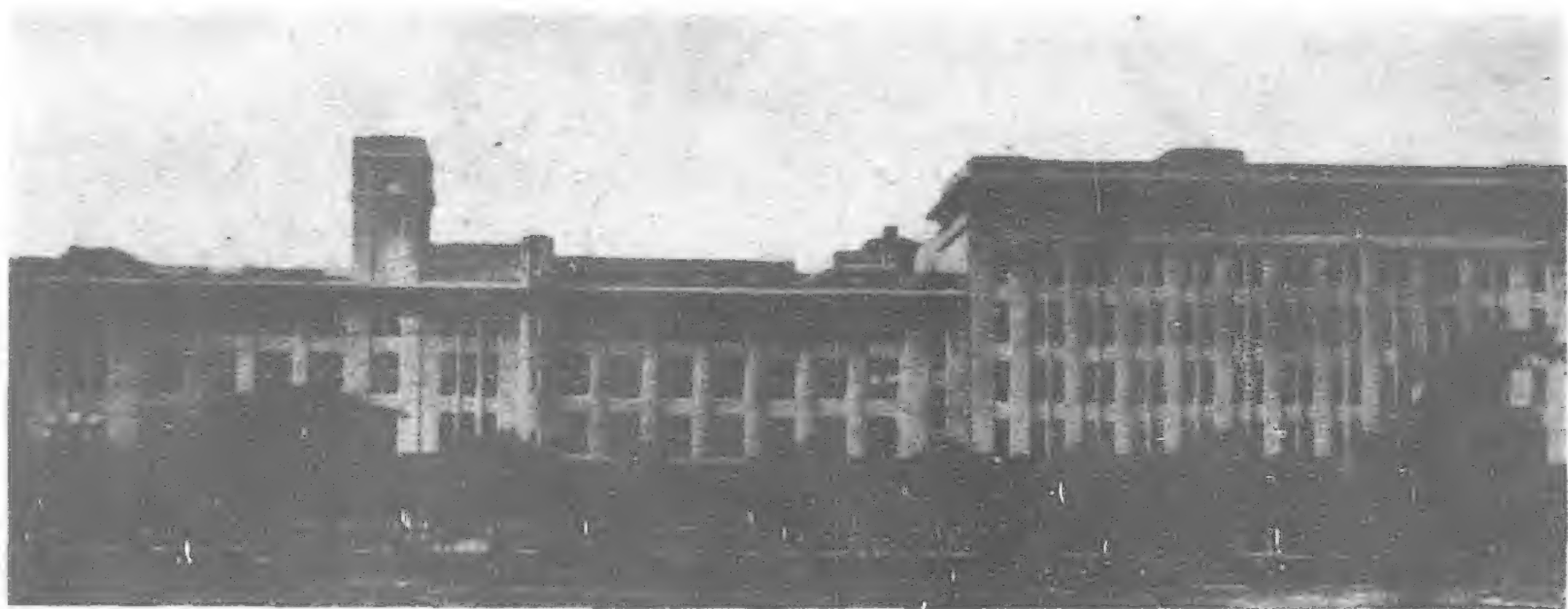
Also striking has been the progress in transformer engineering since the World War, in which period a large number of big generating plants have been built and transmission voltage has been raised to 154,000-volts in some cases. In 1925, transformers of 150,000-volts already had been built and put into service, and to-day it is quite possible to manufacture still more powerful machines with a capacity of no less than 80,000 kva. and the voltage raised to 220,000-volts.

As a feature in recent years, it has become common to equip transformers with load voltage regulators, the fruit of many years' study in this country, which are intended to regulate the tension of current in the course of transmission. On the other hand, the prevention of lightning damage has been made the object of research and experimentation and results including the new winding and insulating methods, the insulation in relation to transmission line, etc., which have resulted in a wholesale renovation of insulating methods and in the principles of the design of transformers. In the experiments, powerful testing equipment was used to determine the impulse voltage of lightning, and the Electro-Technical Laboratory of the Communications Ministry for instance, installed a 3,600,000-volts impulse tester, far more powerful than the 1,050,000-volts machine of the General Electric Company.

There is constant improvement in electric motors. Various makers produce different types with characteristics suited to different purposes. The induction motors, due to its low cost and the simplicity of operation, is widely used for small capacity purposes, and the leading makers have remarkable designs for use in spinning, rayon and machine tool plants.

This particular motor is adding to its market from day to day because individual drive is displacing collective drive, and all factories are tending toward the use of one motor for each process.

For rolling steel shapes, a direct current motor of Ilgner type, with a continuous rating of 4,500 h.p. at 50 r.p.m., was manufactured in 1926, and a motor of the same type, capable of 7,000 h.p. at 80 r.p.m., whose Ilgner converter is equipped with a 7,000 h.p. induction motor, was constructed in 1932. Several machines of the



Head Office of the Mitsubishi Trading Co., Ltd.

same type have since been produced and put into operation in succession.

For rolling steel sheets, a local producer designed and built all electrical equipments for a continuous strip mill, which is 42 inches wide and capable of rolling 450,000 tons of sheet annually. The mill is equipped with four main induction motors, each having a capacity of 2,500 h.p., three D.C. motors, each developing 3,500 h.p., two D.C. motors each developing 3,000 h.p., and 400 auxiliary motors, which consume 30,000 kva. of power in all and supply electricity to all operations including rolling, conveying, shearing and other related works.

In the field of small capacity motors, some specialize in pot motors, specially designed for individual drive in rayon spinning, which are compatible with an extremely high speed up to 10,000 r.p.m. and are operating at 8,500 r.p.m. in practical and continuous works. Hundreds of thousands of such motors have been produced, contributing a great deal to the growth of rayon industry in this country.

There has been notable progress in synchronous motor engineering, and 5,000 h.p. 109 r.p.m. motors were manufactured for gas compressors and 5,000 h.p., 3,000 r.p.m. machines for blasting furnace use.

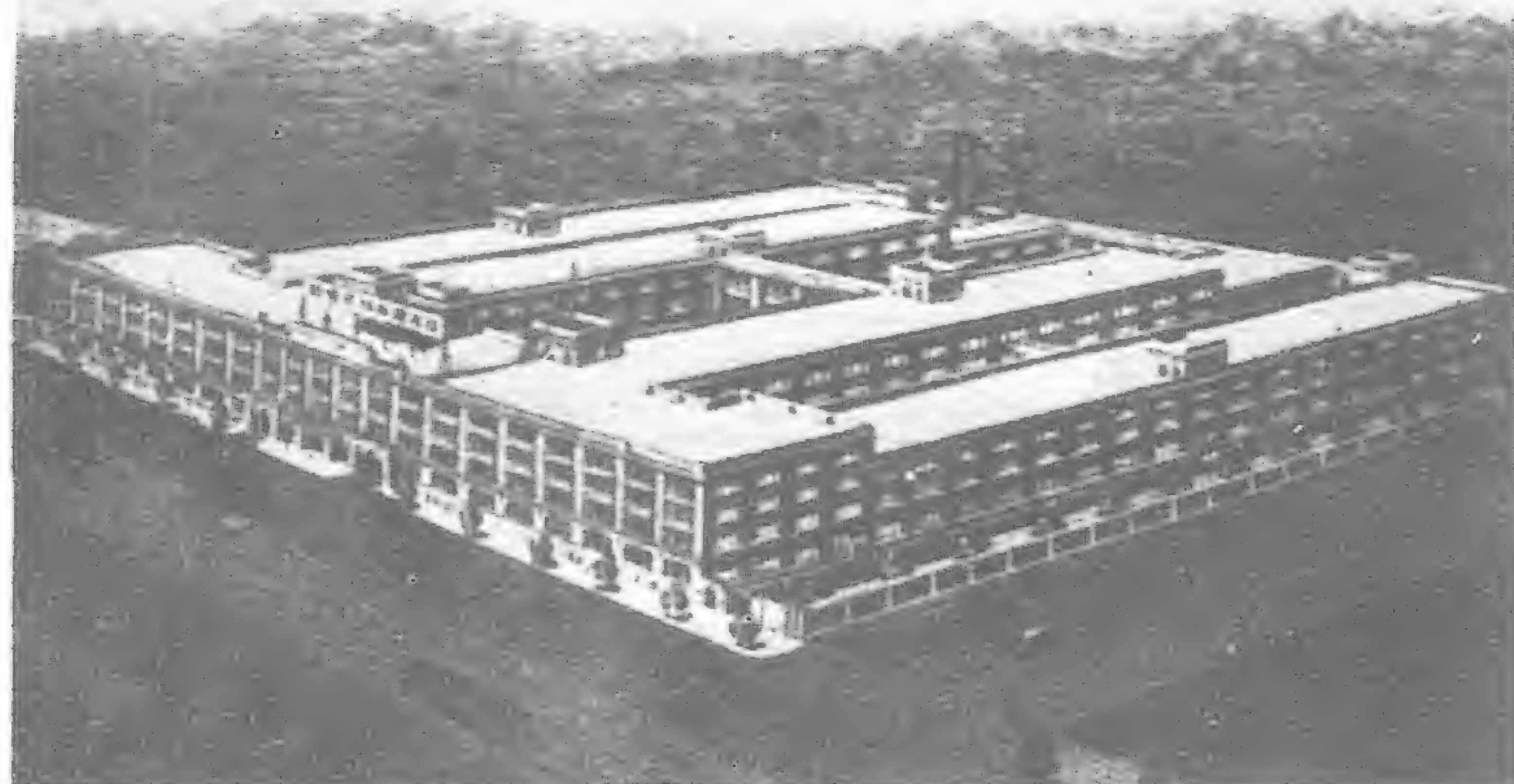
In the field of electric locomotives, the Railway Ministry designed in 1928 the first unit of the E-F 52 type, a 108 metric-ton locomotive equipped with six 225 kw. motors, and in 1931 the E-D 16 type. The success of both induced all private makers to compete in this special line. At present, all locomotives in operation in this country have been produced in entirety by Japanese firms. Electric cars with internal combustion engines have been gaining popularity since the first one, which was a 100-ton, 750 h.p. unit, was built in 1934 by the South Manchuria Railway Company, and one of 68-ton and 500 h.p. by the Railway Ministry in the following year.

Rotary converters have likewise shown technical gains year by year. The record installation of three-phase 60-cycles, 600-volts, 300 kw. of 1914 was surpassed by a six-phase 50-cycles, 600-volts, 1,000 kw. installation in 1920. Some converters installed in urban districts include a feature tried for the first time in Japan, i.e., special devices enclosed in the draft tubes in order to make the machines dust-proof and noiseless. To-day 2,000 kw. converters are used widely by electric railways, while 6,600 kw. installations are common in chemical plants. In this connection, mention should be made of the 30,000 kw. phase modifier which was completed in 1928, establishing the capacity record of the world in that year.

Mercury rectifiers for several years after 1920 were of glass tube construction, designed for a few score of amperes at some 200-volts. Their application was very limited except for charging storage batteries. In 1927, however, a rectifier of iron construction for a capacity of 300 kw. at 600-volts was produced the first of the kind in this country. Because of technical progress in this direction, it is not difficult at present to make glass rectifiers up to 500 A., 600 V. capacity. The rectifiers of iron construction are very widely used by electric railways, and, on



Plant of The Togami Electric Works



Head Office and Factory of The Nippon Electric Co., Ltd.

the other hand also are finding their way into chemical plants because they are primarily designed for stationary installation, are capable of withstanding a large overload, and can develop high efficiency under a light load.

The recent discovery of a method of controlling the mercury arc by means of a grid-controlled vapor tube has made it possible to design larger rectifiers and to apply them to more numerous kinds of electrical machinery than ever before, and Japanese makers are perfectly competent to produce such capacities as 1,500 V., 2,000 kw. for electric railway use, 700 V., 5,000 A., 3,500 kw. for chemical use, 20,000 V., 1,000 kw. for high tension communication machinery, 600 V., 400 A., 240 kw. in glass tube construction and 15,000 V., 10 A., 150 kw. in the glass tube for high tension purposes.

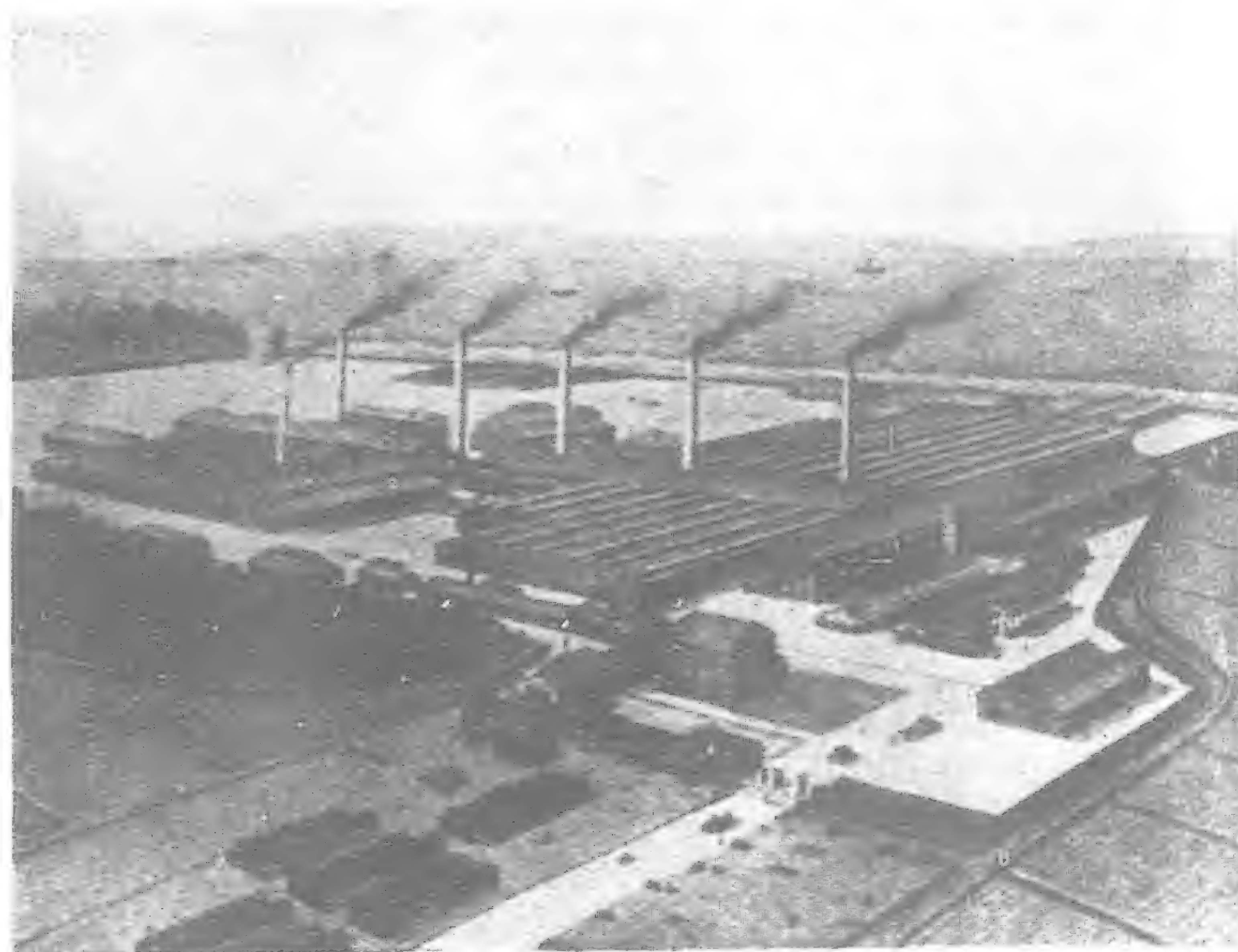
Japan-made electric power machinery and instruments are not only supplying domestic needs but also are becoming increasingly important as export items. Exports in this field in 1936 reached ¥16,000,000.

Appliances of Small Capacity

Electrical appliances used in private residences and business offices include heating and cooking equipment, laundry and home irons, radio receiving sets, washing machines, floor cleaners, fans, clocks of various kinds, toasters, coffee percolators, water pumps, cigarette lighters, desk stands and other fixtures for illumination, electro-therapeutic instruments, incubators, ice-making machinery, refrigerating machinery, electric refrigerators, toys and numerous others. Fine workmanship goes into these appliances, but they are sold at surprisingly low prices as the result of highly-developed engineering skill and the Japanese nation's characteristic cleverness with its fingers.

For radio reception, crystal sets for a short time after 1924 were used by most listeners in. Now they have been replaced by eliminator sets. Midget sets on the market are attractively designed, combining the traditional Oriental taste with Occidental fashion. Their efficiency greatly increased by special wiring methods, Japanese receiving sets are rapidly gaining ground in markets abroad.

Most of the articles enumerated above are manufactured under official supervision concerning design and construction, under the Electric Appliance Supervising Regulations of 1934, which will function to improve further the quality of Japan-made electrical articles.



Factory of The Osaka Togyo Kaisha, Ltd.

Electric Wires and Cables

It was not until about 1897, when electric light and communication industries were developing apace, that electric wires were produced on an appreciable scale in Japan. In the beginning, bare copper, cotton and silk covered and other low grades of wire were produced for the most part, but now rubber-covered wires have become a common product to all makers. This industry entered a period of great prosperity after 1907 when many big power plants, operated either by steam or water, were built, and telegraph and telephone systems were extended throughout the length and breadth of the Empire.

Thanks to the inflated demand thus created, all makers enlarged their production facilities and, at the same time, took a long step forward in manufacturing technique. Since 1910, electric cables had been produced, with special attention to the needs of telephone and power transmission enterprises, and since the World War part of the domestic output has been exported to many Oriental countries, the South Seas, British India, Australia, Africa and South American countries.

By the end of the World War, all cable makers had developed their own technique by absorbing the features of leading foreign manufacturers so that their products were of the best quality in the world, and, because of an abundant copper output, which was in excess of the annual consumption at that time, their production increased by leaps and bounds, and their products included the entire list of wires and cables, i.e., copper, aluminum, brass, silicon-copper, cadmium-copper and iron wires, and wires for telephone and telegraph, electric power distribution and illumination, heating, radio, mining equipments, ships, textile machinery, etc.

High tension cables for power transmission, though insulated by rubber at the outset, are now insulated, up to 22,000-volts capacity, by oiled paper. Their quality was much improved by assimilation of Western technique, and since 1926 Japanese makers have been producing belt and oil-filled type cables. In 1929, an oil-filled cable for 154,000-volts coupling capacity use was manufactured in this country.

For underground service, oil-filled cables up to 65,000-volts capacity are produced in large quantities at present. The high record of 85,000-volts already has been attained. Japanese manufacturers in the electrical



Head Office and Factory of The Sumitomo Electric Wire and Cable Works, Ltd.

field have studied the electrical, physical and chemical properties of insulating materials, and some of them are fully prepared to manufacture cables of still higher tension.

Cables for electrical communications are produced under the strictest specifications. Outstanding developments in this category include carrier current telephone cables insulated by gutta percha or paper, and city telephone cables containing as many as 2,400 circuits. All of these Japan-made cables have been functioning satisfactorily in practical service.

There has been an increasing export trade in cables of late. Exports in 1936 reached a total value of ¥13,700,000, representing an increase of ¥2,320,000 over those of the previous year.

Electric Cells and Batteries

The most remarkable progress in the electric cell and battery industry in this country has been made by the dry cell manufacturing branch. As early as 1893, cells were being produced under Japanese patents—cells which compared favorably with imported products. Their market has expanded rapidly with the improvement of quality and reduction of the production cost, and even more rapidly since they were recommended as the source of anode for vacuum tubes.

There was, however, a temporary retrogression in dry cell consumption after 1927 when alternating current was widely adopted for use in radio receiving sets, but a large new market was opened for dry cells in the meantime in the illuminating field, notably for Bicycle Flash lights. Because of the simplicity of operation and convenience, they are now an indispensable part of the electric supply throughout the country.

Storage batteries, despite the fact they had been used for sundry purposes since the earlier stages in the development of electric machinery, were not utilized as a source of light and motive power until 1892 when more than 100 batteries, all for 400-500 ampere-hours, were installed. Afterwards, the sizes and capacities were increased and they were adopted for the control of power generating stations and the adjustment of load variations between day and night hours, and as a source of emergency light in time of current interruption in theaters, hospitals and schools, besides a power source for wireless communications, medical treatment and scientific experimentation.

In the field of communications, storage batteries were adopted for the telegraph service between Tokyo and Osaka in 1902—an innovation in this country. They have become the common source of current supply for telephone services, with the increase in common battery systems and automatic exchange switchboards.

In view of the fact that storage batteries of large capacity were by far the most important factor in the far-reaching activity of German submarines during the World War, the Imperial Navy played the leading rôle in encouraging technical research and industrial application so as to make the nation self-sufficient in its supply of large storage batteries. As a result, there was conspicuous progress in the manufacture of plates toward end of the war, and in 1920 a method was discovered for preparing inflammable lead oxide powders. Patent rights were registered on this in many foreign countries. This epochal invention served to prolong the life of plates by three to five times.

Many notable methods of preparing better grades of lead powders and red lead were discovered and the Imperial Army and Navy and the Railway and Communications Ministries, together with private engineering firms, pressed on with their respective researches into the materials for storage batteries, from both the scientific and industrial view-points.

The demand for storage batteries for radio reception has dwindled, but, on the contrary, the demand for automobiles and other transport vehicles, including railway trains, has increased tremendously. Also there are some demands for stationary purpose in factories and for the adjustment of load variation in the electric power industry. In the future, there will be a substantial consumption by battery automobiles, which are increasing in popularity due to the advance of anti-freezing battery technique. Besides lead

batteries, local makers are producing alkali batteries, most of which are used in the mining industry.

Japan-made electric cells and batteries not only supply the entire annual demand at home, but are also finding their way into foreign markets. Exports in 1936 totaled ¥1,900,000, an increase of ¥200,000 over the exports for the previous year.

Electric Lamps

It is interesting and significant that bamboo produced at Hachiman, Kyoto Prefecture, was carbonized and used as filament in the first electric lamps, an epochal invention in the realm of electrical engineering, by Thomas Edison, in 1879, at a time when Japan was not yet enlightened in regard to electricity. A monument was erected to the memory of this great inventor in the compound of the Iwashimizu Hachimangu, an ancient and greatly venerated shrine.

Electric lamps were produced experimentally in 1890 for the first time in this country. The first for practical service appeared in the following year. But it was not possible then to make more than ten lamps, ranging from 10 to 16 candle-power, per day. Gradually the output was increased to about 100. Notwithstanding the untiring efforts of manufacturers, there was no appreciable advance in manufacturing technique due to the poor evacuation and flashing methods, and the cost of production remained much higher than that of imported lamps. The makers, however, installed more efficient evacuating plants and other machinery, and began to produce cellulose filaments in 1901. But they could not



Hitachi stream-lined locomotive built for The South Manchuria Railway Company, by The Hitachi, Ltd.

keep abreast of the increasing demand, and the bulk of the annual consumption was imported in those years.

The tungsten filaments imported in 1911 proved a great incentive to the manufacture of metallic-filament lamps. The technical advance has since been very rapid, making it possible to produce drawn tungsten filaments, made in helical form and enclosed in gas-filled bulbs, inside-frosted glass, which has been adopted as standard for all lamps up to 100-watts capacity, and double-coiled filament lamps, first marketed in 1936. At present, some makers are producing lamps as powerful as 50 kw., and large-capacity lamps used for ships, pilot lamps for airplanes, and others.

New varieties among the Japanese incandescent lamps include the twin lamps, the double-coiled filament lamps, tubular lamps, vibration-proof lamps, projector lamps, flashlight lamps, Helio lamps, and various types for automobiles, fishing vessels, talkie exciters and anti-aircraft illumination.

Since tungsten arc lamps were first produced in 1916, the Moore tube lamps, quartz and mercury lamps, and other arc lamps have been offered in succession by local makers, but their application has been limited, primarily because they require expensive accessories and careful attention while in service. All neon tubes were imported until the first Japanese products were placed on the market in 1926. In 1930, local firms built plants necessary to produce the gases enclosed in the discharge tubes. This completely ended the importation of neon gases.

Neon signs, since they were displayed at the coronation of the present Emperor, in 1928, have been used widely throughout the country for street decoration as well as interior illumination.

Sodium and high-pressure mercury lamps are also produced in this country, although they are not yet popular. Attempts are being made to produce low pressure illuminant lamps with fluorescent materials.

The market for electric lamps is constantly widening, despite the differences in circumstances between domestic and overseas markets. At home, there was a temporary lull in the sales turnover at one time, but the situation has since become more brisk, thanks to the recent campaign for better illumination and eyesight, the increased illumination of buildings, and the popularity of projectors and electric sky signs.

As an export commodity, Japanese electric lamps have entered markets all over the world. Taking advantage of the depreciation of the yen since the beginning of 1932, exports have increased by leaps and bounds, now aggregating about ¥10,000,000 yearly. There was an abrupt setback, however, due to restrictions adopted in many countries with the result that in 1935 exports were the smallest in the annals of this trade.

There was a tangible revival in the following year, when exports reached a total of 350,000,000 lamps, valued at ¥12,000,000. These were shipped to various countries in Europe, Asia, North and South America and to Australia. In 1934, an ordinance of the Commerce and Industry Ministry included electric lamps among the principal export items of the nation, making official examination of quality compulsory. Under these circumstances, co-operative export firms were established in Tokyo and Osaka as organs to control the trade.

Porcelain Insulators

The porcelain industry is one of the oldest in Japan. Highly artistic and decorative articles have been produced for centuries by its traditional technique. Since the introduction of the telegraph system, insulators for telegraph wires have been a product of the old firms in Arita, Saga Prefecture; Seto, Aichi Prefecture; Aizu, Fukushima Prefecture, and other ceramic centers in various districts.

All insulators for electric power transmission, largely of the pin type, were imported at the outset, but these were soon superseded by domestic products for low tension and high tension not exceeding 3,500-volts. Those for still higher tension, however, were imported in most cases, the Tokyo Electric Light Company, for instance, being obliged to import the entire supply for the 55,000-volts transmission line it set up in 1904.

Technical research in this direction, however, was very fruitful in the years following, so much so that in 1909 insulators of a Japanese ceramic firm were used for a 44,000-volts line, and later for a 66,000-volts line. The quality was further improved as a result of microscopic study, and other scientific research peculiar to Japan, so that the local products reached the highest world standards in 1912, and covered almost the entire list of porcelain ware for electrical use, including insulators for transmission lines and transformer sub-stations, bushing of various kinds, etc.

The first suspension-type insulators were imported in 1914 for the 110,000-volts transmission line of the Inawashiro Hydro-Electric Power Company. But in this product, too, the Japanese soon surpassed foreign producers. Their products are already being used for 154,000-volts transmission, and they are now preparing to produce insulators and bushings for a 200,000-volts line to be erected in the near future. Moreover, they manufacture a special variety, known for its low induction loss, for use in wireless and carrier-current communications.

Insulators are no longer imported. Leading Japanese makers, on the other hand, are exporting in considerable quantities to Europe, British India, the South Seas, China and other markets. In 1935, these exports reached a total value of ¥971,000.

Electric Measuring Instruments

The manufacture of electrical measuring instruments, as an industry, has developed so rapidly in recent years that the entire annual demand is now supplied by Japan-made products, which combine special features created by Japanese engineers with the advantages of European and American types, thus adding to their reputation as the best in the world.

It is only in comparatively recent years that integrating meters have been produced on an appreciable scale in this country. The manufacture of these instruments was greatly stimulated by the

Electric Measuring Law of 1912, which required that all measuring instruments for electric power transaction be officially tested by the Electro-Technical Laboratory of the Communications Ministry, the Japan Electric Association, and other authorized institutions. When the law was enforced, there were in Japan not more than 15,000 integrating meters, all imported. Two years later, Japan-made meters appeared on the market. At present, more than 400,000 meters are put into service annually and all are the products of local electrical instrument manufacturers.

Indicating gauges, such as voltmeters, ammeters, and watt-meters unlike integrating meters, had been produced in Japan for some time before, although most makers confined themselves to small meters for use on distributing boards or for measuring motive power consumption. It was after 1910 that precision indicating gauges for portable purposes were designed and made in Japan.

Manufacturing technique has advanced, and at present it is not difficult to produce frequency meters, power-factor meters and "Megger" type ohm-meters whose characteristics and performance are guaranteed.

Japanese makers now produce standard induction meters, standard batteries, Weston batteries and standard resistances, and they never fall behind foreign makers in respect to other delicate laboratory instruments, such as potentiometers, bridges for resistance determination, induction meters, photometers, fluxmeters, oscillographs, etc. Current limiters for use in Japan, though wholly imported at the outset, are now all supplied by local makers. In the manufacture of copper oxide rectifiers and accessory instruments also the Japanese are keeping abreast of the advance in wireless and high frequency engineering technique. Finally, mention must be made of the pyrometers, various types of which are being offered by Japanese makers to meet the increasing demand from the manufacturing industries of Japan.

Electrical Engineering Materials

Remarkable progress has been made in the manufacture of electrical engineering materials. At present all except a few special lines are available from local manufacturers. In the case of iron castings, big makers have their own foundries, and most of the steel sheets for electrical machinery construction also are produced within the country.

Magnetic steels of international reputation have been developed by Japanese scientists. The K.S. and M.K. magnetic steels, developed respectively by Dr. K. Honda, an outstanding metallurgical engineer and president of the Tohoku Imperial University, and Dr. T. Mishima, Professor at the Tokyo Imperial University, are outstanding. In addition, the "Sendust" core powder and some oxidized magnetic metals of Japanese make are known as the best materials. Electrolytic copper of high purity and excellent quality is produced here, and exported in the form of electric cables and wires.

Japanese carbon brushes are no longer inferior to any made abroad, and self-sufficiency in carbon electrodes for furnaces and carbon grains for telephone receivers has been attained.

Nichrome heating wires and their substitutes are produced in abundance in Japan. Nor is it necessary to import tungsten filaments for electric bulbs or manganese resistance wires. Aluminium ingots, for which Japan was dependent upon foreign producers for many years are being produced in increasing quantities, and are improving in quality. Soon the nation's entire need will be produced here.

As insulating materials, not a few natural products were used almost without treatment in the beginning, but later they were scientifically treated so as to obtain more suitable properties for different purposes. These are micanite and micales, made of natural mica, and fibro-cement and ebony-asbestos processed from asbestos.

Habutae (silk), paper, textile, cloths and other fibrous products, all of which are abundant in Japan, are made into better insulating materials by impregnating them with asphalt, paraffin and other petroleum products, linseed oil, wood oil and other vegetable oils, or copal, rosin, shellac and other natural resins. Research is now being made into synthetic resins.

The products of mica and asbestos are used extensively as insulating materials where heat-resisting properties are specifically required. But both natural materials are short of the demand in this country, and are being replaced by steatite products, which

have not only heat-resisting, but also desirable electrical and mechanical properties and can be produced from materials available here. Steatite has been the object of chemical study, with tangible success, to make it a promising insulating material.

Research work has thus resulted in a marked improvement in the quality of Japanese electrical engineering materials. Local makers now supply most of the insulating and constructing materials used in Japan excepting only those whose materials are not produced here.

It was not until 1868 that the glorious Meiji Restoration aroused Japan from its state of isolation, in which it had closed its doors to foreign civilization for nearly three centuries under the Tokugawa shogunate (1600 to 1867).

With its awakening, Japan began to seek knowledge far and wide, and to make use of the merits of Western law, economy, education, science and art. And, as is well known, Japan has made remarkable progress in all lines in the past 70 years.

In the early part of the Meiji era the Japanese people had little knowledge of science and no industries at all in the modern sense. The electric machinery and instruments manufacturing industry was then, of course, only in its infancy.

It is not too much to say that this industry in those days, using the advanced Western technique, was in the age of imitation and that the efforts of the manufacturers centered chiefly on making their products resemble those manufactured in foreign countries. With the march of time, however, the industry gradually emerged from the age of imitation as the people's knowledge was increased and the technicians ceaseless efforts bore fruit. It was the European War that hastened the progress of the electrical industry. Following its outbreak imports of electrical machinery and instruments ceased, with the result that Japan was forced to supply her own requirements. Accordingly, there were increasing attempts to improve the imported electrical articles and to invent new electrical machinery and instruments. The technique of Japanese manufacturers, after

many years of experiment, reached a level at which it elevated and expanded the industry to such an extent that it could not only supply the domestic demands for electrical machinery and instruments but also could make large shipments to world markets.

Since then the products of Japanese electrical manufacturers have been steadily improved, with the enlargement of markets, the advance of manufacturing technique and the accumulation of experience. Now the industry is moving toward the stage of creative production, emerging from the period of imitation.

The fact that the number of application for patents to the Imperial Patent Bureau in 1936 reached 3,091, and for utility models 5,377 proves how progressive the industry has become.

The principal items of electrical machinery and instruments mentioned herein hold the highest records with regard to capacity and working voltage. Looking back to that period about ten years ago when Japan was dependent upon foreign countries for most of its electrical machinery and instruments of large capacity, it seems that another age has come.

Manufacturers of the smaller types of electrical machinery and instruments and of electrical appliances for home use have made especially conspicuous progress. Makers in these lines are competing in the production of the best at the lowest prices. Outstanding progress has been made recently in electrical installation and design. Intensive studies to improve ventilation, cooling systems and noise-proof devices and to produce circuit-breakers containing as little oil as possible and arrestors with the largest possible discharge capacity are being made, covering all lines of electrical machinery and instruments while the improvement of electrical materials has made the size of machines, smaller and weight of the body lighter and in consequence it is possible to produce turbo-generators of large capacity and high-speed operation. It can be said that the electrical machinery and instrument manufacturing industry in Japan compares favorably with similar industries in the most advanced countries of the west.

Resources Awaiting Development in China

(Continued from page 98)

Russia. Outside the Russian waters, however, Japan is faced with no restrictions.

Japan purchased a second-hand whaler from Norway several years ago and to-day she is operating six whalers in the Antarctic, presenting stiff competition against the pioneer countries such as Norway and England. Japan has already gained third place as a whaling country.

The meat and skin of whales, which have hitherto been thrown away, will be brought home beginning in the 1938-39 season in view of their value as substitutes. A whale can furnish skin that corresponds to the hide of 200 cows. The skin of such fish as sharks and tuna, it has been discovered, is also serviceable as substitutes for hide.

Cod-liver oil is extracted from fish, while sea-weeds yield iodine and other chemicals. Moreover, rayon can be produced from pulp manufactured from sea-weeds.

The ocean is an inexhaustible industrial resource. Japan, being surrounded by water, is in a position to take full advantage of the resources of the sea.

Birth of New Japan

As far as industrial resources are concerned, Japan need no longer worry much about them. But Japan must establish herself as the leader in the new order of East Asia.

This does not mean that Japan will take China outright. China has hitherto followed a policy of depending on Western powers in her anti-Japanese campaign, but the new order, which constitutes the objective of Japan's protracted reconstruction work in China, will co-operate with Japan.

Birth of New Asia

A great East Asia in which Japan and China will work hand in hand for their co-existence and mutual prosperity is about to be

born. When the new order is established, there will be no more anti-Japanese boycott. Even if Japan does not encroach upon the Chinese territory, a vast market will be promised for the Nippon industrial manufactures. In effect, there is no difference between the forthcoming new order in China and Japan's finding a great colony. On the basis of this reasoning, one may assert that Japan has become a "have" country.

For the present in Japan, however, various economic controls are being enforced. The nation is restricted of freedom in various ways. All the efforts are devoted to a successful conclusion of the military operations against the anti-Japanese elements in China. In the face of this fact, the statement that Japan has become a "have" country may sound strange.

But Germany, for instance, is constructing plants to turn out 4,000,000 tons of pig iron and 6,000,000 tons of steel a year, despite the fact that she is a "have not" country. She is also building auto highways that can accommodate four cars abreast in region where one can hardly find a dwelling house. The scale of planning is altogether different in Germany as compared with the petty projects of Japan. This difference originates in spirit.

Hold Optimistic Outlook

Leaders of the continental campaign in Japan urge the nation to take a brighter view of the future, instead of being worried about the enormous spending and the effects thereof.

The leaders consider the "protracted reconstruction work" on the continent on a greater scale and higher ideal. They point out that the industrial resources of the China continent, outlined above, will remain a mere "existence" unless something is done to make them serve the purpose of Japan. This work is not at all easy, but Japan must do it. She must grasp this opportunity to become a "have" country, and national unity is the only means to that end. At the same time, government officials, as well as business circles, must recognize the prospects of New Japan.

Air Conditioning of Manila Railroad Coaches

By S. T. HAGERMAN, in *Sugar News*

ON Monday, January 31, 1938, the first passenger train was run over the tracks of the Manila Railroad from Manila to Legaspi on the Island of Luzon in the Philippines. One dining car and two passenger coaches on the train were equipped with Westinghouse Air Conditioning. The Manila Railroad was put to great expense in completing its line from Manila to Legaspi. The oneway trip requires from twelve to twelve and one-half hours under a tropical sun on a new road-bed. The Manila Railroad Company decided to air condition one first class coach and one dining car on each train in order to make the trip as comfortable as possible. The original schedule called for one train each way travelling through the daylight hours. That meant the conditioning of two passenger cars and two dining cars. One additional passenger car was to be air conditioned to take care of the heavier holiday traffic.

In travelling from Manila to Legaspi, the train crosses from one side of Luzon to the other. Consequently, there is a marked change in climatic conditions between the two extremities. While Manila is having its hot season, Legaspi is cool and wet. It was therefore necessary to design the systems to take care of both extremes in climate. The railway is a narrow gauge and the trains are steam-driven. There is thus very little space available for equipment and no power with which to drive compressors. Further, each car had to be individually conditioned so that the complete make-up of a train could be readily altered.

While the calculation of the cooling load on a railway car is no different from that on a building, the full sun load must be expected to strike the windows on one side at some point on the trip. Also, a tropical sun on the roof of a car causes a very heavy heat load. The passenger cars on the Manila Railroad required a CLS-415 and the dining cars a CLS-275.

The compressors were chosen for the load to be carried and appeared oversized in regard to capacity. Mechanical refrigeration was chosen for a variety of reasons, since blowing cold air into cars in a station and then closing them for so long a run was impossible with the high heat load; ice, dry ice or the steam jet was too expensive to use in the Philippines. Hence the CLS unit was the thing to use.

A gasoline generator was chosen in preference to a diesel as suitable power supply for the compressor, the fan and pump motors, because of its lighter weight and quieter operation. The most suitable location for the generator set for accessibility for servicing was against the outer wall, and a diesel in this location would have caused greater unbalance in the car than the lighter gasoline generator. The passenger cars were equipped with Model M1522033H generator sets manufactured by the Universal Motor Company of Oshkosh, Wisconsin. These sets are comprised of six cylinder engines and 12½ kw., 220-volt, three-phase, 60-cycle generators. The dining cars were equipped with Model 2M104033H sets which are comprised of six cylinder engines and 10 kw., 220-volt, three-phase, 60-cycle generators.

The engines of these generators are of the marine type, so it was necessary to provide cooling water for each engine. A spray tank was placed with its upper half raised out of the roof of each car. Four small spray nozzles were placed in each tank. A Buffalo 16-in. Breeze fan was mounted in the end of each tank and louvers were placed in each top. A small Buffalo close coupled pump was used in place of the regular engine pump to circulate the cooling water through the tank and the engine. The limited space available forced the use of a relatively small water cooler on the roof. The

engines run normally at about 180 degrees F. and are operating very successfully at that temperature.

On the dining cars the EV-275 condensers were used with CLS-275 compressors. On the passenger cars the space limitations precluded the use of the Westinghouse EV-415 condensers. On these trains Buffalo No. 1228 condensers were used. Louvers were placed in the side of each car along the length of each generator set. The fans of the evaporative condensers thus pulled air from outside over the generator sets and discharged it through the roof. The additional heat load thus placed on the condensers is not sufficient to overload them. The head pressures have not yet exceeded 135 lbs. under the worst conditions.

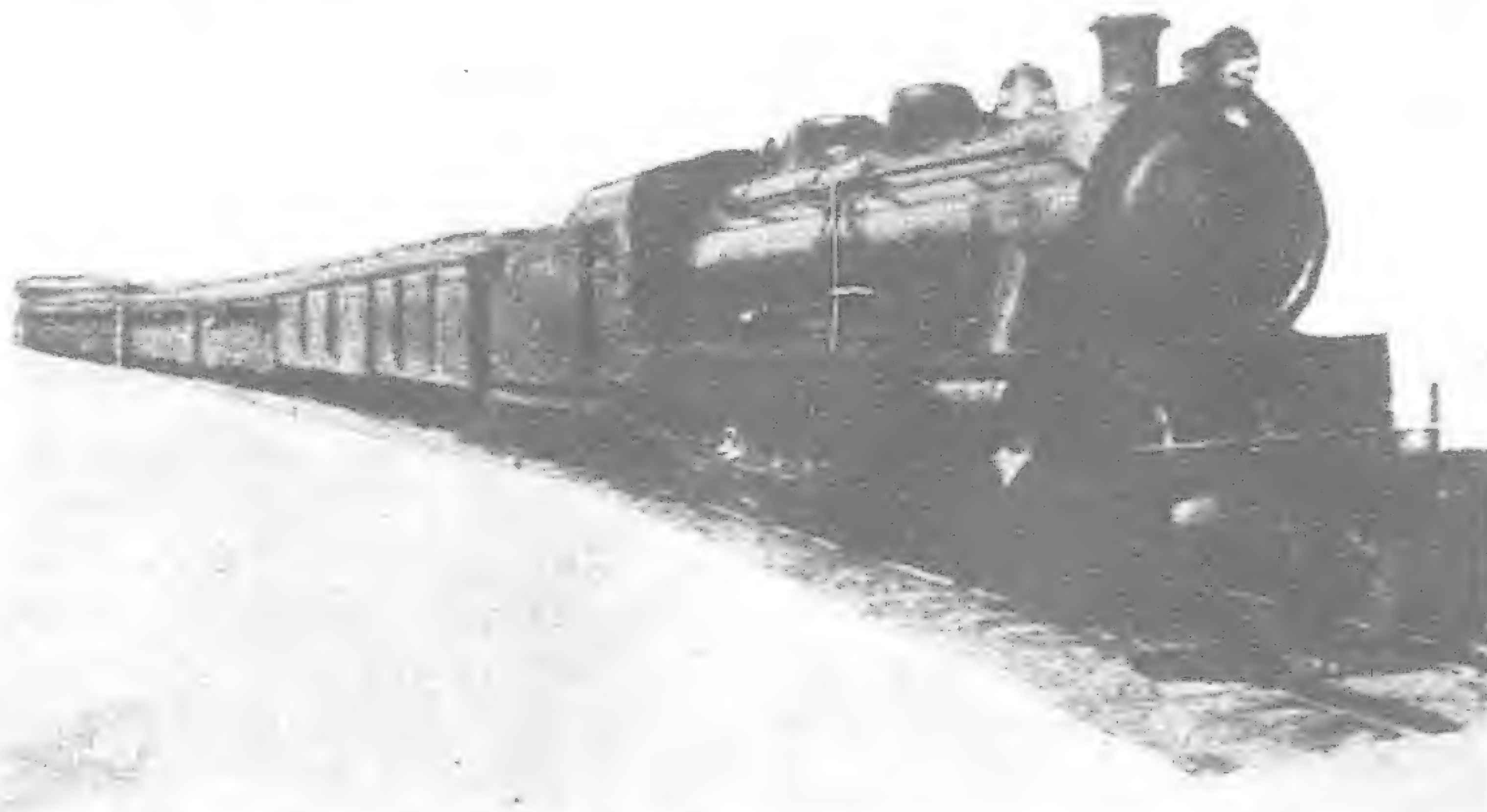
Space requirements and air distribution in the dining and passenger cars indicated the use of two entirely different types of air conditioning units, the one used in the dining car being similar to the old ES units. It contains a WE-37 coil, a Buffalo 152A blower and a one hp. motor. The fresh and return air are mixed before entering the coil. The unit for the passenger cars is made with a fixed by-pass over the top of the coils. The return air by-passes the coils and the fresh air goes through the coils. The coils are two WE-16's in series. The blower is a Buffalo No. 5 Baby Conoidal with a discharge 45 degrees above the horizontal. Shut-off dampers are provided in both the fresh and return air ducts in both cars.

Air distribution in the passenger cars is entirely different from that in the dining cars. The passenger cars are of the compartment type with compartments open to the passageway on one side. The dining cars are considerably shorter and are one space with no partitions. In the passenger cars a duct system was used. The center section of the roof of each passenger car was raised and the ducts placed in the raised part. A ceiling type baffle outlet was installed in the center of each section with a shut-off damper in each outlet. Return air is allowed to travel down the passageway at one side. In the dining cars a short duct was run from the double fan outlet and air was discharged along the ceiling from the end of the car.

Due to the small amount of space allowed for generator equipment and the consequent low generator output, it was not possible to make the air conditioning system automatic. The control is entirely manual. There is no thermostatic control and no automatic voltage regulator on the generator. The low cost of labor in the Philippines makes it both possible and desirable to have an operator in the machine room on each car. The operator maintains the temperatures in the car as desired. A temperature recorder is placed in each car. The daily record of temperatures is sent to the Mechanical Division of the railroad for checking. The operation also checks the gasoline and water consumption thus guaranteeing continuous service. A by-pass was installed on each compressor and fittings were made and installed between the compressor discharge valve and the compressor suction valve and the compressor casting. A line was run from one fitting to the other with a shut-off valve in the line. This by-pass valve (which is a ¾-in. valve) is left open only until the compressor gets up to speed. Leaving the valve open will cause reduced capacity and over-heating of the compressor motor on gas cooled machines. The compressors will ordinarily start without the opening of the by-pass unless a high head pressure exists at the moment of starting.

In the installation under discussion the water cooling tanks, gasoline fuel tanks, compressor by-pass valves, air conditioning units, ducts, grilles, and louvers were all made locally.

(Continued on page 119)



Manila-Legaspi train trip made pleasant by air conditioning

New Buildings at Karachi Airport

(Indian Aviation)

KARACHI, the converging point of five air lines, the center for a large volume of traffic and one of the world's air traffic centers, was the rallying point for all the flying clubs of India, in fact for most of the civil aircraft in India, on December 5 and 6, 1938, on the occasion of the opening of the airport's new buildings by His Excellency the Governor of Sind.

In declaring the buildings open, His Excellency stated that it was an honor to take part in this inauguration because this was a matter outside the normal duties of a Provincial Governor and a pleasure because he took a strong personal interest in the development of aviation.

Although the airport was in a sense, a subsidiary matter, he regarded it as one of vital importance to flying, for, without a Port, there could be no effective navigation.

Referring to the buildings, he stated that the requirements of an airport were strangely different from those of a seaport and that therefore people could appreciate how great had been the mental travail which had been expended in planning the new buildings which represented to-day the latest word in the conception and construction of an airport. The requirements of the airport in the near future might require expansion and alterations later, but at present the new buildings were the latest word. He paid a glowing tribute to Commander Watt and to Mr. Russell, as well as to Mr. Tymms. Karachi, he stated, was aerially the front door of India and it was therefore a matter of special pride for him to inaugurate the new buildings and to declare the new Karachi Airport open for air traffic. With the breaking of the Civil Ensign in front of the new buildings it was declared open.

Serving Twenty Countries

The airways radiating from Karachi Airport directly serve 20 countries in three continents and it is the junction through which passes all air traffic between the eastern and western hemispheres.

This administration building is the first of its kind in India to be designed to meet all the requirements of a terminal airport on a comprehensive scale. The architect is Mr. R. T. Russell, C.I.E., D.S.O., F.R.I.B.A., the Consulting Architect to the Government of India, who has followed the general principles first embodied in his design for the Willingdon Air Station at New Delhi, and now developed to full scale.

The form of plan selected for this building as well as for similar buildings at the larger Air Stations in India has been determined by the general principles of aerodrome layout and control adopted

in this country. The administration building, hangars and other subsidiary buildings are for this reason grouped in one place, in an angle of the field wherever possible, with the former building projecting centrally at the apex of the building layout. This enables the Control Officer to have a clear view down the fronts of the receding buildings as well as of the field and thus see all movement operation.

Administrative Side

The new building contains the aerodrome and route control, wireless station, meteorological observatory and forecast station, signal station, rooms for the customs examination of passengers and freight, postal sorting, passport and health examination and the technical examination of pilots and engineers for licensing purposes. Accommodation was urgently necessary for these purposes and to serve the needs of passenger mail and freight traffic.

For the convenience of passengers, a restaurant, bedrooms, waiting rooms, lavatories, post office, telegraph office, telephones and a bookstall are essential facilities now provided, while operating companies now have traffic offices, booking counters and a pilot's room.

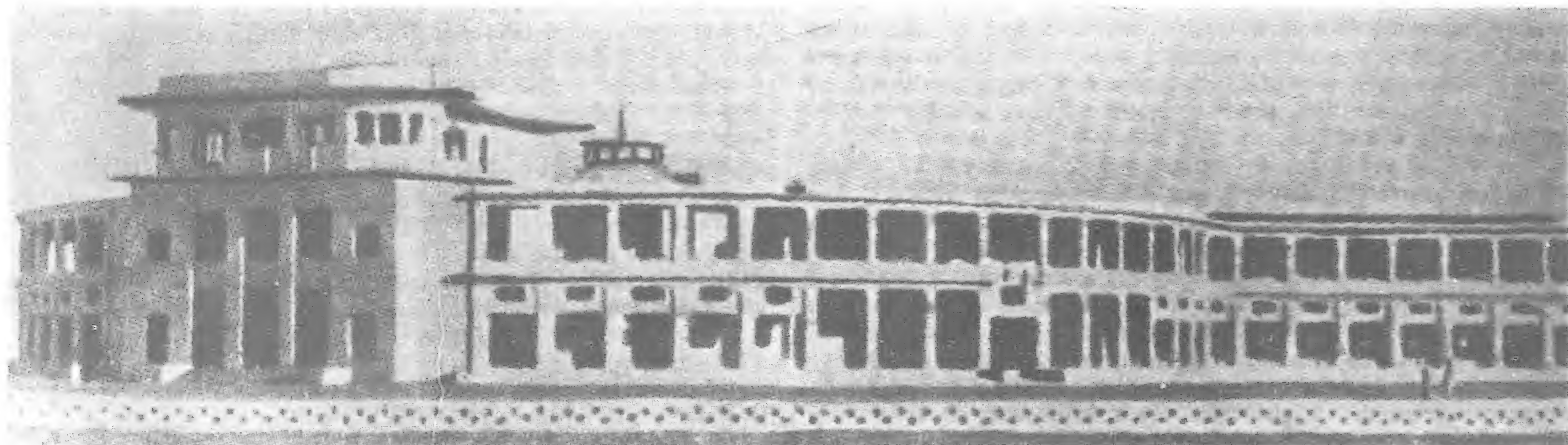
To ensure smooth co-ordination and unimpeded flow of traffic of all classes, all the accommodation has to be arranged suitably around a focal point.

The Focal Point

This focal point is provided in the new building by the Central Booking and Waiting Hall which runs up through two floors with a gallery at the first floor level. Various company booking offices are grouped round this Central Hall. From it, three wings radiate—the main plan of the building being an inverted Y. The arm of the Y which projects into the aerodrome, accommodates the Control and Chief Administrative Officers. Other office accommodation is provided in rooms linking the arms of the Y on the ground floor and also around the gallery on the first floor. The other two arms of the Y contain, respectively, on one side the restaurant with bedrooms over on the first floor, and on the other side Customs with Postal department above on the first floor.

From the Central Hall passengers for abroad and overseas depart by a corridor leading to "passport and medical inspection" and those arriving proceed through another "passport and medical inspection" and on through the Customs Hall. Passengers for local traffic take the opposite corridor.

(Continued on page 110)



A view from the Aerodrome of the Government of India's New Airport Administrative Building at Drigh Road Aerodrome, Karachi, which was Officially Opened on December 5 by His Excellency Sir Lancelot Graham, K.C.S.I., K.C.I.E., I.C.S., Governor of Sind. This Airport is well equipped to deal with all the requirements of Commercial Aviation and the New Building provides a very adequate remedy for the Old Accommodation difficulties

The Geo-Political and Strategic Importance of Waterways in the Netherlands Indies

By Lieut.-Comm. F. J. KIST

(*Bulletin of The Colonial Institute of Amsterdam*)

IN an article* entitled "The Significance of the Maritime Routes in and through the Netherlands Indies," Lieutenant-Commander M. M. Merens pointed out the importance of the sea routes in and through the Malay Archipelago. There are, however, various other aspects to this subject, besides the ones he dealt with. The waters in which the Netherlands Indian Archipelago lies are of sufficient moment geo-politically and strategically to deserve further treatment. But since the importance of a route depends on the significance of the places it connects, one can hardly attain to a realization of the geo-political significance of these sea routes without first devoting some consideration to the countries they touch.

The name Netherlands Indies itself indicates the first problem in the field of geo-politics. For does it not show that in this island-world the power is not wielded by the natural inhabitants, but by a European nation? Hence, owing to the urge, inherent in every people, to seek self-determination, the germ of certain internal tensions is present in the Archipelago. Obviously, then, its political structure alone justifies our interest in the Netherlands Indian Archipelago from a geo-political point of view. Its importance becomes more obvious still when we consider its geographical position with respect to the other Pacific powers.

The first point that strikes us is that the Netherlands Indies constitutes a considerable proportion of those territories situated along the southern boundary of the Pacific Area which are marked in European colors, and furthermore that the islands of the Archipelago are the natural extension not only of the continent of Asia but also of the marginal islands which, together with the narrow, comparatively shallow coastal seas, separate the Ocean from the continent. Further we note that although the Netherlands Indies—except near Palao, one of the Pacific islands under Japanese Mandate—is not directly adjacent to the Japanese islands, the area which separates the two countries is but a narrow strip as compared with the distances obtaining in the Pacific area generally.

This proximity is not of itself necessarily a source of tension. But if we compare the present-day political map with that of earlier times, we shall see that after remaining stable for ages, the color indicating Japanese influence has, since the middle of the last century, increased regularly, stage by stage, proceeding—as far as the sea route is concerned—Southward. When we consider, further, that in a few years' time the Philippines, which form the natural buffer between the Japanese and Netherlands Indian islands, will no longer belong to the powerful United States of America but will also present an Asiatic color on the map, the geo-political significance of the Netherlands Indian Archipelago stands forth vividly as an area in which, naturally, possible conflicts between Asiatic and European powers might be fought out. I may remark at this point that Australia and New Zealand, although they have become virtually independent countries and can no longer be classed as colonial settlements as they originally were, must yet be regarded as being within the range of European power, owing to the nature of their inhabitants and their position as part of the British commonwealth of nations.

The second great purely Asiatic power, namely, China, also exerts pressure on the Netherlands Indies, although the fact may not be discernable on the political map. If, however, we should make a map indicating the distribution of different races, we should see that even on the densely populated islands of the Archipelago, the Chinese form a group which is by no means inconsiderable, although it does not on these islands reach the proportions it has assumed, say in the Straits Settlements and some of the Malay States. Nor must we forget that the Chinese are further advanced as regards economic insight than the natives are, so that their influence is greater than their mere numerical strength might suggest. It is not surprising, then, that the Chinese question is a subject of international politics and one to which the Government is obliged to devote constant attention.

One of the causes of the above-mentioned tensions and movements is rooted in the differences in density of population in various areas. Within the confines of the Archipelago itself a great number of different conditions obtain. Java, for instance, is one of the most densely populated areas in the world, is over-populated, in fact, but on the other hand there are several islands, New Guinea for one, where there is still a vast amount of room available.

Viewing the subject from a higher point of vantage we see still greater contrasts. To the North and North-west of the Netherlands Indies we find over-populated areas—Japan and Southern China—whereas to the East lies Australia, with an extremely sparse population and room for several millions, but with its door closed against all Asiatics. Hence, in that vast region of which the Netherlands Indies is the center there is an extraordinary, one might almost say an alarming, inequality of land utilization. It is no wonder that countries which are obliged to seek relief from over-population try to get rid of their surplus by sending it to those that appear almost to be calling for people to develop the land. On the other hand it is easy to understand why objection is often made against large-scale importation of foreign elements, particularly in connection with race-differences. A mixture of races almost inevitably leads to friction, especially when the immigrants have a strongly developed sense of national unity which prevents their being assimilated by the population of their adopted country and results in their remaining a group apart with interests of their own.

Inequalities in the various countries as regards the distribution of raw materials; of desirable outlets for marketable products of industry and agriculture; of minerals and particularly of oil—all cause shifting, or efforts to shift, spheres of power or influence. In this connection we must not omit to mention the urge to expansion of power simply for the sake of power as such, and the mission felt by many peoples to propagate their national culture or their religion.

We cannot, within the limits of this article, go into the question of how strongly these and possibly other influences have affected the above indicated shiftings in the balance of power and tensions in the neighborhood of the Archipelago, but certain it is that they have invested this area with a great geo-political significance. Special attention should be paid in this connection to the fact that the Netherlands Indies is rich in oil, which in neighboring countries is scarce.

Turning now to the maritime routes—the writer has already remarked that these are chiefly important because they connect different countries with one another and hence make possible the transportation of passengers, produce, goods and, last but not least, armaments and other means to power.

The Netherlands Indies being a very important area geo-politically, as shown above, it follows that the sea routes to and through the Archipelago are also very significant in this respect. For is not the free use of such routes a matter of life and death to an island world, unless, indeed, such islands should be entirely self-sufficient. The latter is by no means the case in the Netherlands Indies. In the first place life depends, economically speaking, practically on export of agricultural products and minerals and, moreover, the islands are obliged to import industrial products and, in several cases, also food. With regard to this last point, we may add that the need to import is partly the result of using the land for the cultivation of crops for export. If this were abolished, the food problem would be considerably less urgent, but on the other hand the economic significance of the Archipelago would be very much smaller.

From this it follows that the Indies need routes connecting them with the outer world. Traffic within the Archipelago itself is essential, too, as the islands supply each other mutually with necessities. The export articles of one island are things that, on

*In *The Far Eastern Review*, December, 1938.

another, have to be imported. Naturally inter-insular traffic ways are essential, both economically and for the purpose of administering the government. When we consider further that these same sea routes constitute the South-western entrance to the greatest highway on the globe, namely, the Pacific; that they connect Eastern Asia with Australia, Africa and even Europe, we can no longer doubt their significance. Even if the islands themselves had no geo-political importance, if they were merely sandy wastes, even then the maritime routes in their vicinity would attract the greatest interest in the field of international politics.

From this we see how important traffic routes are, as such, and how necessary it is that proper attention should be paid to their maintenance in order that transportation along them may be as safe and easy as possible. And if the power within whose territory or control these routes fall fails to attend properly to these requirements, various other interested parties will feel constrained to assume the responsibility of so doing. That the Home Government and the Government of the Netherlands Indies are fully conscious of this fact is plainly evinced by the large sums expended annually on making maps and charts, on hydrographic services, on buoyage, on illumination and beaconing. This particular point will be referred to more in detail at the end of this article.

There is another reason why oceanic areas may be important from the geo-political standpoint, namely, that from them may be drawn certain products of industry in which more than one party is interested. In this respect, too, the Netherlands Indian Archipelago is a case in point, chiefly on account of the fish and pearls with which her waters abound.

During the last few decades difficulties have repeatedly arisen in connection with fishing done in Netherlands Indian territorial waters by foreign craft. In this connection the Japanese evinced a tendency to disregard laws and ordinances prohibiting foreigners from fishing in the very rich territorial waters of the Archipelago. The authorities have been repeatedly obliged to take a strong stand in the matter, sometimes adopting severe measures. Another difficulty with regard to fishing arises in the field of economics. Japanese fishermen use motor vessels equipped with the most up-to-date fishing tackle and their enterprises are led by men educated and trained scientifically for the job. This enables them to put on the market such large quantities of fish that the native fishermen, who ply their trade in the same old way as their forefathers, are in danger of being deprived of their living. The authorities are, indeed, trying to raise the standard of the native fishing trade, but for all that the problem is by no means solved.

The pearl fisheries are a different matter. Most of the pearl-banks, as for instance those near the Aru islands, are beyond the jurisdiction of the Netherlands Indies, as they lie out in the open sea where all comers have equal rights. But this leads to difficulties between rival fishermen of different nationalities, and hence becomes another potential source of political tension.

Intimately related to the geo-political significance of the maritime routes through the Netherlands Indies is the strategic significance of these waters. As remarked above, the economic existence of the Archipelago depends entirely on free maritime traffic. This means that if the maritime waterways were cut off for any length of time, the population would be submitted to an intolerable pressure. Such blocking of sea routes therefore constitutes a means an aggressor might employ as an effective way of forcing a people to grant his wishes.

In case of a conflict with the Netherlands, enemy craft may be expected to appear in Netherlands Indian waters in order to block traffic there. The first objective would probably be to destroy any Dutch warships present in this area because these would try to hamper the enemy's movements by attacking him on these maritime routes. If this should prove impossible owing to the latter's strength, the Dutch would then endeavor to cut his lines of communication as these would naturally coincide with these very routes.

Unquestionably the geography of the Archipelago presents great possibilities for counter-actions on the part of the Netherlands. Countless straits and bays offer the defending party good places of refuge and hence bases of operation from which sea and air craft can carry on their activities, thus providing the greatest possible freedom of movement. The enemy can profit by these much less, as he cannot make preliminary preparations in the same way and hence has less chance of replenishing supplies of fuel and food. Consequently both his freedom of action and his opportunities for exploring and scouting are very much more restricted.

The strategic significance of these maritime routes from a national standpoint is therefore a dual one. These waterways offer the enemy an opportunity of exercising a certain pressure on the people, and, on the other hand, they enable the defender to carry on a strategically defensive but tactically offensive action under favorable conditions.

As regards the more general strategic significance of the seaways through the Archipelago, it appears that traffic from the Pacific to the Indian Ocean and vice versa is crowded into a few comparatively narrow straits. To avoid these would mean making a very long detour. In these narrow passages ships lack the protection which the great open spaces of the Ocean give, and this makes these straits the natural points where shipping may be seriously hampered.

The question of the strategic significance is therefore intimately connected with another one: are there any nations for which passage through Netherlands Indian waters is a matter of vital concern, or would the prevention of shipping mean merely a casual inconvenience?

It would be difficult to give a general answer to this question; for naturally the constellation of the belligerents would greatly affect this matter. We may safely assert, however, that there are various possible configurations, in which the maintenance of shipping routes through the Malay Archipelago would be for more than one Power, if not a matter of life and death, in any case a most important consideration, and the closing thereof cause others very serious inconvenience. The strategical importance of these routes becomes even more evident when we reflect that war materials, hence also naval armaments and troop-ships with their provisions, will also have to be transported to and from the Pacific via these routes, and that, here too, the same difficulty—namely, that the way leads through comparatively narrow and crowded passages—has to be met. These passages are an area where a fleet is likely to come face to face with the enemy, and consequently these areas will prove a strong attraction to belligerent naval powers.

In case of either a trade war or a naval struggle, we may therefore expect to find the belligerent forces in the Netherlands Indian waters. It is not even unlikely that the decisive battle will be fought there. That Britain realizes the strategic value of these areas is shown by her establishing one of the strongest naval bases in the world at Singapore. At this point, then, the British naval forces can replenish their supplies, from there they can proceed to action with well-filled holds, hence at high speed, and there damaged material can find a safe berth. None of the possible future enemies of Great Britain possesses a base of this kind in the vicinity and all will therefore be obliged to provision their vessels in such makeshift shelters as they can find. As already remarked, there are many such shelters to be found among the islands of the Malay Archipelago, but these are all within territorial waters. To make use of these places of refuge would, in the case of Holland remaining neutral, be a violation of that neutrality and the same may be said with even greater force about the use of existing harbors.

This brings us to the question of neutrality, the importance of which problem is largely due to the great strategical significance of the Netherlands Indian maritime routes. On the one hand the Netherlands will be expected to close all areas within her jurisdiction to all belligerents, and on the other pressure may be put upon her to establish footholds; or else there will be attempts to make use of her territorial waters without permission. Every facility accorded to one of the contestants will be a form of support; any use made of territorial waters by one party, will be regarded by the opposite as support conceded to the enemy, and this will be so even though the Netherlands have remained ignorant of the fact.

In other connections, too, the maintenance of neutrality involves embarrassing problems. The unequal distribution of oil in the Pacific area, for instance, lends great importance to the question whether oil should be supplied to belligerent powers and, if so, in what quantities.

We will not try to answer all these questions here. One thing is certain, however, namely that the Netherlands Indies will need to have powerful and numerous forces to defend her neutrality or herself against enemy acts of violence.

In view of these facts it is no wonder that of recent years, with the collapse of the post-war conception that war can be outlawed, the urge grows stronger and stronger to take rapid steps towards building up armaments—naval, aerial and military—in the

Netherlands Indies worthy of the great political and strategical significance of the maritime routes in those regions.

From a geographical, or rather an oceanographical, standpoint the Netherlands Indian maritime routes West of the Straits of Macassar present a great contrast with those East of that passage. The seas and straits to the West, located on the Asian continental shelf, are nowhere more than 100 meters deep, while in the East a depth of 1,000 meters is usually found, even near the coast. In the Celebes Sea the depth is as much as 5,600 meters in some places and in the Banda Sea depths of even 7,500 meters are met with. The most Easterly route in the Archipelago, namely, the one between Australia and New Guinea, is again of comparatively slight depth where it traverses the continental shelf of Australia.

These facts are of special importance to seafarers in view of the unknown dangers they may meet on their way. For in these shallow tropical seas it often happens that reefs of only small diameter rise up steeply from the sea-bottom to within a short distance of the surface. These reefs are very difficult to find because they are so small, and even after careful, dense sounding some of them may still be undiscovered and therefore unmarked on the chart. It is therefore not impossible that unknown dangers may still lurk along the sea routes through the Straits of Malacca and across the South China sea, the Java sea and Western portion of the Straits of Macassar. In the Eastern part of the Archipelago there is much less chance of any such hidden reefs, although here, too, ships are exposed to certain dangers. These are confined, however, to areas not exceeding 200 meters in depth. Outside such areas it is most unlikely that there will be unknown dangers still lurking in well-charted seas.

It is hardly necessary to observe that even in such seas safety can only be insured when use is made of reliable charts. Such charts are available for the Netherlands Indian maritime routes, for the whole Archipelago with the exception of a small area to the South-west of New Guinea—which is unimportant for the shipping trade—has been sounded, surveyed and charted. The maritime area between Sumatra and Borneo is being surveyed anew at the present moment. The finished charts are included in the "Catalogue of Maritime Charts and Books" (*Catalogus van Zeekaarten en Boekwerken*) published by the Hydrographic Division of the Ministry of Defence at the Hague.

As remarked above, a hydrographic survey of the shallow-water area is not sufficient to ensure the mariner absolute safety. In connection with this fact the most dangerous portions of the chief sea routes are being dragged. This is done by two dredgers steaming down the whole course of the fairways with a line, which is kept at a certain depth by means of floats, stretched between them. The Straits of Durian, Riouw, and Berhala have been thus dragged; the routes through the Strait of Banka, the Gaspar Straits and Strait Karimata are now being worked on.

Another thing is necessary to ensure a safe passage, namely, that points of danger, such as reefs and banks should be well marked, thus enabling a mariner easily to recognize such points night and day and obtain his bearings by the use of his compass or goniometer. The Netherlands Indies Department of the Navy has had buoys (light-bearing and otherwise), beacons and lighthouses placed at all points where they may prove useful to those at sea. Data regarding buoyage are published annually in the "Notice to Mariners, Batavia No. 1" (*Bericht aan Zeevarenden Nederlandsch Indië, No. 1*), while the 537 lights are listed and described in the *Lichtenlijst van Nederlandsch Indië*.

Besides keeping the sea routes in order the Department also supplies seamen with information on various matters of moment to them. In this connection mention must be made in the first place of the "Mariners Guide to the Netherlands East Indies" published by the Hydrographical Department aforementioned. In this volume may be found, besides a detailed description of fairways, harbors and coastlines, a wealth of details regarding the various coastal towns and a comprehensive treatise on climate and tides. The tidal constants at more than one hundred points are given. Hence by a simple calculation the water level at any point and at any moment may be ascertained. For the convenience of those consulting the guide, complete tide-tables have been given for nine harbors which are only navigable for large ships at high tide. These nine harbors are: Belawan, Kutei-River, Pontianak, Banjarmasin, Palembang, Aru Bay, Surabaya Oostgat, Surabaya Westgat and Chilachap.

Tides are of special interest to ships about to enter a harbor, but there is another matter which is extremely important to seamen everywhere, namely, currents, their strength and direction. On this subject information is given in the Mariners' Guide and in current-tables for 11 points on the route through the Straits of Malacca and across the Java sea, and for the Strait of Sunda. These tables show, for each day in the year, at what time the current reaches its maximum, its strength, and its direction, and the time at which it turns.

In order to provide seamen with the necessary facts for keeping their charts, guides, light lists and buoyage tables, up-to-date, the Naval Department publishes almost every day a notice to mariners for the Netherlands Indian Archipelago. These notices are reprinted in the "Notice to Mariners" published by the Hydrographic Division of the Ministry of Defence at the Hague.

The above shows that both the Home Government and the Netherlands Indian Government are fully aware of the importance of giving every care to the up-keep of these routes through the Archipelago and of placing up-to-date information at the disposal of those who use them.

New Buildings at Karachi Airport

(Continued from page 107)

There are two large covered terraces on the first floor for the use of the public when flying displays are held or on other occasions.

Largest Hangar in India

With the opening of the administrative building, the large new hangar adjoining will also be placed in service. This hangar, the largest in India, comprises two bays each 190 feet in span and 100 feet in depth, and will house the biggest air transport aeroplanes yet built or building. It provides in addition some 15,000 square feet of floor space for workshops, stores and offices. Other works at Karachi which are now being brought into use comprise an extensive range of residential buildings for staff. An isolation hospital has also been built and taken into service in connection with the measures for preventing the spread of infectious diseases, particularly yellow fever.

For reasons of economy there is no elaborate scheme of decoration. The main Hall of the administrative building has walls panelled in teak and the floor is of terrazzo laid out in a simple design. In the center of the Hall there will be a circular table with an illuminated map of India in relief to show the various air routes. All other rooms have plastered and distempered walls, the floor finish being terrazzo in the important rooms and

granolithic with terrazzo borders and skirtings in the less important ones.

The External Design

The most usual and economical building material in Karachi is the local stone which is a rather poor quality of sandstone of a buff color and only obtainable in maximum lengths of 2-ft. 0-in. and an average finished bed of 8 to 10-in. depth. This influenced the external design to a very great extent and the more so-called "functional" style which has been adopted elsewhere in India for similar buildings could not be followed in this case.

Up-to-Date Ground Organization

The new buildings have been constructed by the Central Public Works Department of the Government of India working under the general direction of the Civil Aviation Directorate, as a part of the Capital Works Program for Civil Aviation drawn up in 1934. The opening of the new building marks the virtual completion of this program, which for an expenditure of approximately 81 lakhs is providing India with an up-to-date, though still incomplete, ground organization for aviation on the Trans-India route and the principal feeder routes.

Industrial Development of Greater Tokyo and Meaning of City Planning

By S. HAYASHI, Chief of the City Planning Section, Tokyo Municipality

YEDO was the Capital of the Tokugawa government in the days of feudalism for three hundred years and it has now become the seat of the Imperial Government, or the Greater City of Tokyo. Its rapid progress in becoming a center of culture and industry as well as of politics is so remarkable that may be said that not only it dominates the country as the capital but even aspires to reach the highest position after ceaseless efforts for years past. A capital city is said to be the barometer indicating the national strength. For enrichment to provide a source of economic power we need nothing but an increase in the industrial products of the city. The industrial districts of the city, therefore, where machines and labor work together, are the kitchen to supply the necessary means of livelihood while the city center where magnificent high buildings are making the streets beautiful, is the front entrance.

In the most prosperous days of feudalism, there lived some two millions of people in Yedo, mostly composed of the samurai class, thus making it only a city of consumers. This characteristic of the city lasted for some time even after the Imperial Government removed from Kyoto to Yedo, changing the name to Tokyo in 1868. In order to meet the demands merchants and tradesmen had to come up from every section of the country. Though the people mingled together—merchants with samurai—yet the nature of the city changed but little. After the Sino-Japan and Russo-Japan Wars were over, capitalism in Japan sprang into existence and then the first step in building the new city of Tokyo was taken. In general, a city where the wealth of the nation is accumulated, becomes an amusement center; for instance, Rome in the old days was one such. She was overthrown, without difficulty, by savage tribes because the source of the State's power was not there in the city but in the rural districts where the conquerors came from. Statesmen in the Tokugawa era looked upon agricultural affairs as the essential business of the state. No doubt, the natural function of a city is to consume but this is not all its work.

The so-called city planning of the past was intended to protect the wealth by building high walls encircling the city limits and to make the capital an amusement center for well-to-do people. In the early part of this century, the city planning for Paris by Oman should have such a tendency.

A city of the new age, however, disregards such traditions and starts as an industrial center. There consumption becomes larger, production increases to meet the demand as a general thing, so that the idea concerning a city as a one-sided center for consumers should be discarded, and the true meaning of the modern city should be created as a place where laborers and the citizens at large may live in comfort. City planning is changing the system from comfortable living to a place to work in with satisfaction. Living in comfort and working with satisfaction do not contradict each other, since where there is an easy place to work, it is easy to build up a city in which to live in comfort. It is the mission of a modern city to establish economic projects as the key to industry, and carry these out energetically.

Modern cities as industrial centers naturally change their appearance. The wonderful driving power of a great city overcomes all obstacles, and casts away everything in the way of a blockade; it operates to create facilities of communication—canals, tramways, wider streets—all in order to build up a modern city. This is for nothing else but to secure the efficient working of industry—the live force of the city's activities. Sir Christopher Wren's reconstruction plan for London after the big fire in the 17th



The Ginza, The Fifth Avenue of Tokyo

century regrettably was not carried out. So that the difficulty in reconstructing a big city so as to develop it naturally yet without any regulations, is clearly shown in this case.

What is the present condition of Tokyo? It was of course a national calamity—the great earthquake and fire of 1923, but we were thus given an opportunity to rebuild the city on a big scale and to carry out city planning in accordance with the desire of the government and the people. This covers, however, only the area of the old city; there is the vast area of the newly annexed districts still left awaiting completion.

City planning for Tokyo is just started and will require a large amount of money and labor for its completion if we are to pave the way for further progress and putting it under city control. Therefore, the original scheme of the city planning by which to envisage the city in the future is liable to err by negativism. Though it is unavoidable that present-day city planning should readjust the old city plans largely, yet there must be positive city planning to control and supersede them.

The budget of the city planning work for Tokyo for the year 1937 is in brief as follows: though the plans for high-speed facilities of communication, a central wholesale market, a livestock market, a slaughter house, and crematories are not executed yet.

Streets, including squares and bridges	..	..	Y1,042,695,000
Sewerage	..	..	251,207,000
Rivers and canals	..	..	67,500,000
Water supply	..	..	113,046,000
High-speed facilities of communication	..	..	187,000,000
Readjustment of land divisions	..	..	114,808,000
Parks	..	..	25,805,000
Pivot bridge	..	..	3,180,000
Central wholesale market	..	..	24,900,000
Livestock market and slaughter house	..	..	2,400,000
Cemeteries	..	..	1,156,000
Crematories	..	..	570,000
Preparing building sites	..	..	1,233,000
Defensive work against high water damage	..	..	9,699,000
Total	..	..	Y1,845,199,000

The above table shows a total of over one billion eight million odd yen of which fifty per cent (50%) has been spent up to the present time. These vast industrial enterprises will surely provide a great motive power for building up a great industrial city of Tokyo, particularly the street planning that requires more than one half of the budget to connect the city center with the suburbs through the main lines of outgoing roads and the completion of circling roads. This will bind the old and new districts of the city together to make an organic body.

Water supply, sewerage, bridges, canals, high-speed facilities of communication and readjustment of land divisions—these kinds of work, parallel with street planning, will develop the lands of the city and act as an important factor in controlling it. These are all under construction.

Tokyo, a city that has more than six million people in an area of 55,892 hectares and is said to produce two billion yen a year is becoming a great commercial city, on the one hand, but has many, of the evils that naturally accompany a great city, on the other hand. There are problems of health, and protection of the citizens against aerial attack; for that purpose, density of the population should be avoided and the tendency of the present day is to change the old central city system and divide the city into districts with their several wards. The moving of resident districts to the suburbs encourages the development of resident centers and thus increased communication equipment rapidly becomes needed. Tokyo city, therefore, has already decided to build four squares, viz: Shinjuku, Shibuya, Ikebukuro, and Otsuka, and it is well known that Shinjuku square is now under construction. After their completion, these district squares as subcenters of the city will contribute a great deal to increasing commercial business transactions in the resident districts. High-speed facilities of communication are planned to connect the resident district with the business centers.

The streets along the main tramway lines where business and resident quarters exist side by side are planned to be used as commercial quarters and to make intensive use of land it is planned to build houses up to the highest limit allowed in connection with the site. As to the commercial quarter in the heart of the city, it is planned to complete the communication and traffic systems, so that in this regard Tokyo may stand comparison with large cities in Europe and America.

The plan for markets and slaughterhouses whence a supply of fresh provisions in abundance is to fill the city's larders is now completed and beginning to function.

Now, we must change the subject from city planning for resident and business quarters to the project of forming industrial zones which are to occupy 28 per cent of the entire area of the city but which, we regret to say, is far from completion. However, there are at present the Keihin industrial zone utilizing land and sea lines with Yokohama harbor located near by, along the Tokaido; Koto or East of the Sumida river, and the canal. These are well established and accord with the natural environment. To build the city as a good residence place for laborers we must wait till industrial district regulations are realized. Exempting the industrial districts of the Keihin and a part of the Koto, more than half the area of the industrial districts of the city area are left under the illogical system of district appointment; therefore there are vast undeveloped areas left untouched, on the one hand, and a cry for ground for industrial plants unheeded, on the other. The rising of the value of the land has encouraged the intended division of the industrial districts of the greater city. In order to make it easy to build up the industrial districts, the regulation of production zones, and the rationalization of development of the industrial districts must be achieved first of all. The present industrial district of Tokyo, including greater districts to be annexed in the future, are well planned in view of the physical and social environment, but a good knowledge of technique is required regarding sub-dividing the area and carrying out the plan to develop industry. Changing the appointed districts should not be allowed but in case of conflict in selection and if the environment is changed a great deal readjustment may be made.

The greater part of Tsukijima was finally designated as an industrial district together with the reclaimed land of Shiba and Shinagawa, though the inclusion of Tsukijima had long been a vexed question. But merely designating it as an industrial district would

not make it an ideal area for industry. The industrial districts marked off according to the regulations now in force are mixed areas which will retard the development of great factories, but if they move out to the city limits this will desolate the former districts. This is one of the cases where the lands of this city are managed badly. In recent days, Article 4 of the Building Regulations for the city was revised, so that permanent homes for industry alone were secured. But difficulty in marking out these districts is anticipated from the complex nature of the land for utilization. District divisions decided according to the purpose for which they are to be used are taking place gradually; therefore, establishment of the district system in order to complete their utilization must be carried out at all costs.

Of the general plans by which the activity of the industrial districts will be advanced, there are schemes for streets, rivers, repairing of canals, improving bridges, water supply and the sewer system, these are under operation within the old city limits but not yet in the newly annexed part. The greatest obstacle to prevent the development of Koto or East of Sumida river, is found in the difficulty of drainage work on account of the low-lying lands, but the city is working to repair rivers and canals and construct defensive works to guard against floods; the shore protection work of the outside circle of Susaki is completed already but the entire work will not be finished until the 18th year of Showa or five years hence.

Tokyo harbor as the water front of the Capital of course is important for the future development of greater Tokyo. The restoration work of Tokyo Bay begun by repairing the Sumida river was done without any connection with city planning, but hereafter

every project of harbor district must be worked out in close co-operation with the city planning scheme. In the days when Tokyo harbor becomes the cardinal point in the development of high-speed facilities of communication which are to connect the reclaimed land and the Koto industrial district and when the Keihin canal plan is completed, Tokyo will become a typical city of great industries.

In this way, the greater industrial city of Tokyo is nearing its completion, conquering



Industrial Center of Tokyo

Nature by modern engineering skill on the one hand and bringing pressure upon primitive industries on the other. Certainly the solving of the social problems connected with the damage done to agricultural fields and aquatic products by the bad water overflowing from the vast reclaimed lands should not be neglected. The essential purpose of agricultural cultivation in the city is to form an oasis for the citizens for their health's sake and also to meet the necessity of planning to have industrial green fields in the city. The regulations for so-called industrial green fields is for maintaining fine landscapes and protecting agriculture. As a protection for the aquatic products industry, purifying bad water and building up sewer work are urgent projects.

It may be desired to extend the city planning of Tokyo all over the Kanto district while developing the city as an economic center, this being required by increase in the greater residence area. The fundamental economic projects should be started vigorously. The planning for the city must be established upon the rationalistic plan of dividing the districts. The planning of the streets should be projected according to the special nature of each, of the various ways of utilizing them and in accord with the synthetic plan of the city. The plan for arranging districts with the aim of building residence quarters must go one step further and build commercial sites. Plans for the harbor, markets and aviation grounds are so important that they should be decided as city-planning enterprises.

In short, the fulfilment and strengthening of the economic plans of the city to meet the needs of the present war that may last for a long time to come are most necessary at present, and thus the development of industrial enterprises is one of the special missions of the planning for the greater Tokyo of to-morrow.

Communications in Korea

THE first railway in Tyosen was the Keizyo-Zinsen line opened in 1900, and this was followed in 1905 by the opening of the main line between Keizyo and Husan. These were undertakings by private companies. In 1906 the Keizyo-Singisyu main line, the Masan branch line, both built for army use during the Russo-Japanese War, were opened to the public, and with the former the trunk line from north to south was made complete. In 1906 the Japanese Government took over all existing lines and placed them under the Railway Bureau of the protectorate, but on the Government-General being established in 1910 control of them once more changed hands. During all this time improvement and construction work was steadily carried on, and the year 1910 saw completion of the Heizyo-Tinnampo line; in 1911 the Yalu was spanned by an iron bridge to connect the Korean and Manchurian railways; in 1914 the Taiden-Moppo line in the south and the Keizyo-Gensan line in the center were completed; in 1914 the Gensan-Kainei line in the north measuring 383 miles was started and completed in September, 1928, at the cost of 90 million yen.

In the meantime, single control of the railways in Tyosen and Manchuria being considered advisable from the commercial point of view, the Government-General in 1917 concluded a contract with the South Manchurian Railway Company and entrusted to it the entire management of the Korean State railways. This continued down to March, 1924, when the Government-General again took into its own hands the operation of the State lines in this country.

On the completion of the Hsinking-Tumen Railway in 1933 a new agreement was made by which the North Tyosen Railways viz; Seisin-Kainei, Kainei-Yuki and Kainei coal mine lines have been placed under the management of the above company the length of which is 328.5 kilometers. The company maintains through train services between Seisin and Hsinking to facilitate the shipment of large quantities of cargo from North-Eastern Manchuria to West Japan via North Tyosen harbors and is advancing the harbor construction at Rasin. The company has extended the railway line fifteen kilometers between Rasin and Yuki. The first pier was completed in the former in November, 1935, and a second pier is now under construction.

In 1927 the Government-General proposed a twelve year plan during which to construct a "Tumen River" line and other four lines totalling 1,384 kilometers and to buy out and improve the Zensyu-Riri Railway and other four lines totalling 339 kilometers. At present the foregoing plan is being carried on effectively and when it is completed it is hoped that the railway traffic will enter a new epoch-making period. During 1936 a total of 187.5 kilometers of new tracks was open to traffic. These are the finished parts on the proposed railways along the eastern coast and to

Manpotin on the Yalu and to Keizantin on the headwaters of the Yalu and to Mozan on the Tumen River.

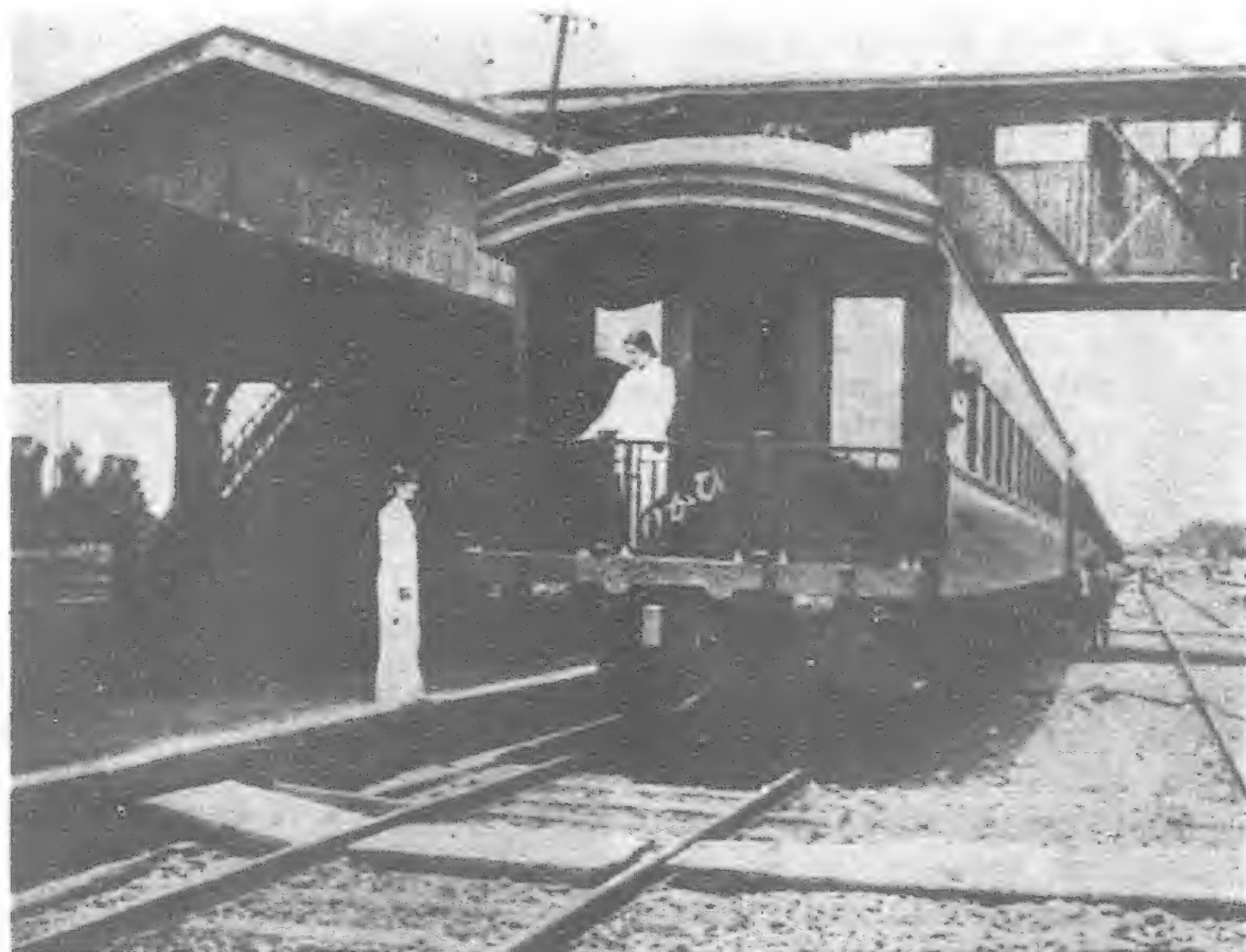
At the end of March, 1937, the total investment in government railways reached over 543 million yen, covering a length of 3,575 kilometers (not including the 328 kilometers of North Tyosen Railways) in active operation with 519 stations and employing 21,000 men in all, inclusive of 8,000 Koreans and two foreigners. The railways in Tyosen, by bridging the Yalu and making connection thereby with the continental railways, became at once part of the international railway system, and this resulted in through traffic being established between Tokyo and Europe. For the connection between Japan Proper and Tyosen, ferry boats make two regular voyages a day each way between Husan and Shimonoseki, covering the distance of 240 kilometers in eight hours. Two large luxurious steamers *Kongo Maru* and *Koan Maru* (7,100 tons) were placed in this service in December, 1936, and February, 1937, giving effective aid to the increasing volume of traffic. The following table gives some idea of railway development.

Fiscal Year	Length (Kilo)	Passengers	Freight (Ton)	Receipts (Yen)
1936*	3,575	33,708,000	9,980,000	65,036,000
1935*	3,389	29,344,000	8,667,000	56,477,000
1934*	3,077	25,614,000	7,681,000	49,666,000
1933*	2,935	22,238,000	7,254,000	43,153,000
1932*	3,142	20,591,000	6,248,000	38,686,000
1931*	3,008	19,670,000	6,025,000	36,300,000
1930*	2,792	20,650,000	5,936,000	36,821,000
	(Mile)			
1925	1,309	18,241,000	4,297,000	30,708,000
1920	1,157	12,421,000	3,186,000	28,816,000
1911	674	2,024,000	888,000	4,095,000

*Metric system.

Of the six lines now under construction the most important is the new line between Heizyo and Gensan across the middle of the country, 213 kilometers in length. This was started in 1926 as a ten year enterprise, and, up to the end of March, 1936, 124 kilometers had been opened to traffic, and it is hoped it will prove another important link in the chain of traffic between North Tyosen and West Japan.

Since the birth of Manchoukuo in 1932, communications of that country with Japan grow day by day, and as the times are good transportation of freight and passengers between the two countries are increasing remarkably. In order to ease these and also to contribute toward the development of resources in the heart of Tyosen, the Government-General proposed to construct a new railway, called *Tyosen* or the *Central Line* about 359 kilometers in length between Eisen (near Taiku) and Higasi Keizyo (in the eastern suburb of Keizyo), and commencement of the work began in 1936.



Railway trains in Korea, on the left the "Hikari" Express, Husan to Hsinking

The hotel business as an adjunct to the railway business is run chiefly for the accommodation of the foreign tourists. It was first started in 1912 at Husan and Shingishu, the two principal terminals, by making use of the upper storeys of each station. In 1914 the Tyosen Hotel was built on a grand scale in Keizyo with two branches at Kongo-san for the convenience of mountain sight-seers, and in 1922 a similar hotel was opened in Heizyo.

Private Railways

For the encouragement of private railway enterprises, regulations were enacted in 1912 making provision for their proper supervision and protection, and in 1914 further provision was made for granting special subsidies to important lines to meet any deficiency in profit below a certain percentage on the paid-up capital of those companies. In 1921 new regulations providing increased State aid for private undertakings were approved by the Diet and put into force for the furtherance of their development. Thus private railways have made considerable progress, though their business condition is not yet prosperous enough to permit paying dividends from their earnings without drawing on the Government. The total length open to business up to March, 1937, reached 1,134.4 kilometers operated by twelve companies, while new lines under construction, actual or projected, embraced some 495.2 kilometers. During the fiscal year 1936 the number of passengers carried on private railways reached 8,350,000, freight 2,065,000 tons, and receipts ¥7,422,000.

There are 91.7 kilometers of tramways under operation of which the major ones are as follows:

The Keizyo Electric Company Tramways in Keizyo ..	36.2	kilos
The Tyosen Gas Electric Company Tramways in Husan ..	21.6	"
The Heizyo Municipal Tramways in Heizyo ..	13	"
The Keizyo Tramways Company line in Keizyo ..	14.4	"
Others ..	7.1	"
Total ..	92.4	kilos

From April, 1936 to March, 1937, these tramways carried 97,053,000 passengers and 270,000 tons of freight and receipts amounted to ¥4,770,000.

Navigation

In the year 1912 matters relating to routes, ships, seamen, beacons, etc., were all systematized and placed under the Communications Bureau of the Government, and during 1914-15 not only were the marine regulations unified and adjusted but a marine court was created. In 1933 a Seamen's Training School was established in Zinsen (later moved to Tinkai) to improve the standard of seamanship, and in 1935 the Tyosen Safe Navigation Act was enforced in accordance with the International Convention for Safety of Life at Sea and the International Load Line Convention which two conventions Tyosen joined as a member in July of the same year.

Before annexation there existed a few small shipping concerns under government protection, and they were induced to amalgamate into one big company, the result of which was that the Tyosen Mail Steamship Company came into being in 1912 and was ordered to establish regular coasting services. There are now eight shipping companies in Korean waters. During the year under review the Government-General considered further facilities for shipping the increasing cargo from Manchuria and Mongolia to North Tyosen. At the same time a shipping company was required to commence a regular ferry boat service between Reisui and Shimonoseki for the convenience of communications between the South-West Tyosen and Japan Proper.

In 1910, ships of all kinds entered in the Shipping Register

numbered only 88 with a tonnage of 9,300, but the regulations of marine affairs under the present regime led to great progress being made in maritime traffic, and especially during the Great War the shipping business enjoyed an extraordinary boom. At present the number of Government-directed routes regularly operated is 20 with vessels (steamships) aggregating 53,206 tons, their routes being interport, Tyosen-Japan and Tyosen-China.

NUMBER OF VESSELS REGISTERED IN TYOSEN

Year	Steamers		Sailing Boats	
	Number	Tonnage	Number	Tonnage
1919 ..	87	35,682	483	16,432
1925 ..	147	44,520	627	21,075
1930 ..	196	53,998	692	22,911
1931 ..	203	52,258	750	25,138
1932 ..	223	58,003	756	24,889
1933 ..	235	57,920	796	26,573
1934 ..	271	55,606	864	29,171
1935 ..	320	58,588	947	32,752
1936 ..	425	62,561	995	36,109

In 1936 there were 9,407 seamen of which 3,738 were officers. In 1903 four Lighthouses were built, and by the year 1906 the number had increased to 53, but as this represented merely one signal for every 176 nautical miles, and navigation around the archipelago on the south-western coast was particularly dangerous during the foggy season, further great increase has since been made. The total number of navigation aids now stands at 356 comprising 188 night, 144 day, and 25 fog signals, in the proportion of one night signal to every 50 nautical miles of the entire coast.

Principal Navigable Rivers

The Yalu (Oryokko) river forming the boundary between Tyosen and Manchoukuo rises from Hakutosan (the "Ever-white" Mountains 9,000-ft.) and empties into the Yellow Sea. The whole length is about eight hundred kilos of which seven hundred kilos, that is, from the mouth to Sinkapatin, is navigable by air-propeller boats under Government subsidy, besides junks and other sailing boats. Its upper course traverses a vast virgin forest region. Timber felled there is made into rafts and floated down its many rapids until it reaches the lumber-yards at Singishu or Antung.

The Daido river flows past Heizyo and empties into the Yellow Sea near Tinnampo. It is four hundred kilos long and has a navigable course of 245 kilos. Steamships of two thousand tons can sail up the river as far as Hosanpo, sixty-three kilos from the mouth.

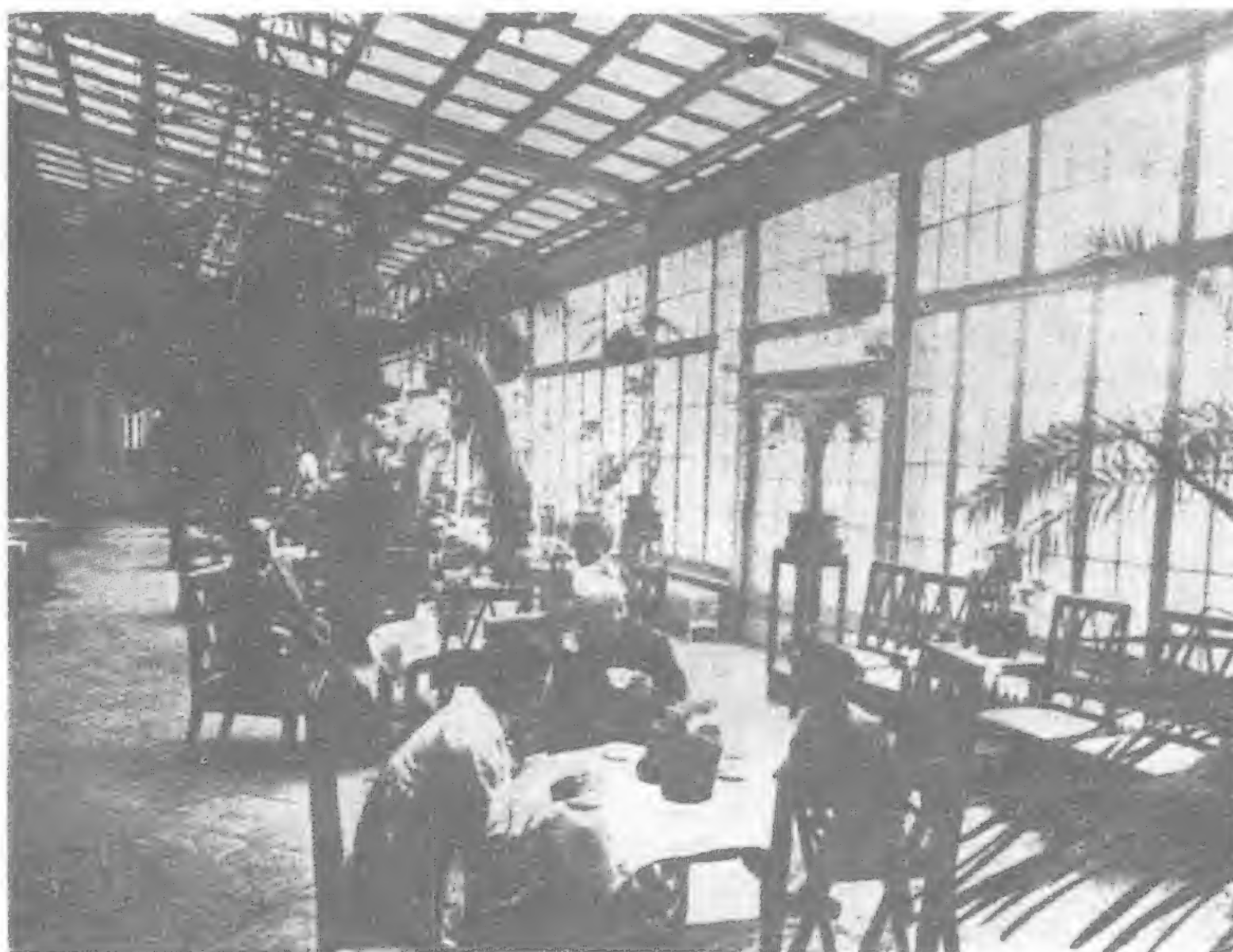
The following important rivers are open to navigation by sailing and motor-boats.

River	Navigable course
Rakuto (flowing into Tyosen Channel near Husan) ..	344 kilos
Kanko (.. .. Yellow Sea through Keizyo) ..	300 ..
Kinko (.. .. " .. at Kunsan) ..	130 ..
Tumen (.. .. Sea of Japan in extreme N.E.) ..	85 ..

Aviation

Air Routes.—It is obvious that the development of air traffic is of tremendous importance to transportation and communication. In order to develop this traffic, it is most necessary to open air routes. Therefore, the Communication Bureau of the Government-General, in accordance with the plan of the Communication Department in Tokyo, formed a plan to develop a trunk air route connecting Japan, Tyosen and Manchuria in 1928, and three air-ports were established, one in Urusan, one in Keizyo and one in Heizyo.

Private Air Transport.—The Japan Air Transport Company, founded by a subsidy



Tyosen hotel, verandah lounge

from the Home Government in October, 1928, opened its regular air service from April 1, 1929, between Tokyo and Dairen via Keizyo for mail and packages, and for passengers from September 11, in the same year. The "Shin" Air Service Company established on September 12, 1936, now engages in the regular air-routes, as air taxis, in sightseeing flights and in flights searching for fish shoals in North and South Kankyo Provinces.

An organization called the Glider Club for the study of this form of aviation was formed on February 19, 1937.

The statistics of the air transport companies in Tyosen at the end of March, 1938, were as follows:

The Japan Air Transport Company, Branch Office	..	..	1
" Substation	..	..	4
" Business Office	..	..	1
" Branch Office	..	..	1
The "Shin" Air Service Company	..	..	1
Glider Study Clubs	..	..	5

Airports were created at Singisyu, Seisin, and Taikyu in 1933, 1935 and 1936 respectively, and also wireless stations with staffs and necessary equipment at Singisyu, Taikyu in 1935 and 1936 respectively. It is expected that such facilities as illuminations, wireless, meteorological offices to complete airway services will be added in the future.

Tyosen has now become one of the international airway centers of the Far East. To encourage Civil Aviation Enterprise the Government-General gives an annual grant to civil aviators to assist trial flights between Keizyo and several important centers in Tyosen as well as in Manchoukuo, for the transportation of aeroplanes, for equipment, and for the consolation or relief of flyers meeting mishaps.

Posts, Telegraphs and Telephones

A Japanese *postal service* in the peninsula was begun with the establishment of a post-office at Husan in 1876, when the port was opened to foreign trade, followed later by the opening of similar offices in other treaty ports with the increase of Japanese settlers. In 1896 the Korean Government introduced a modern postal system, modelling it on that of Japan, and in 1900 formally joined the Universal Postal Union, but owing to poor management and consequent financial loss it was placed under Japanese control in July, 1905, and the Japanese postal system was made common to the two lands. *Foreign Mail Matter* in Tyosen was dealt with by the Department of Communications in Japan Proper until January 1, 1922, when Tyosen became an independent unit, according to the International Postal Convention. During 1936, 9,450,000 ordinary foreign mail matter were handled. Before 1905 there were 427 Korean and 89 Japanese offices, but in 1936 they numbered 1,039, including telegraph and telephone offices. With the establishment of Manchoukuo and its various systems, and in view of the present special circumstances, a postal treaty was made at Hsinking between Japan and Manchoukuo on October 26, 1935, which came into force on January 26, 1936.

The beginning of the *Telegraph Service* was in 1884 when a Japanese office was created in Husan for communication with the homeland. Later on, similar offices were established in Keizyo and a few other centers. The submarine cable between Husan and Japan was originally the property of a foreign company, and its management was carried on with few exceptions under the Universal Telegraph Rules, but in 1910 Japan bought the cable for the greater benefit of the public. Each year increase was made in the number of operating offices, and from only 44 in 1905 they rose to 896 in 1936.

In 1910 a *wireless apparatus* was installed on the *Kosai Maru*, an official inspecting steamer, and in the three lighthouses on the west coast, though the service has not yet been thrown open to the public, and in 1923 a wireless office was opened in Keizyo to handle messages sent to and from ships sailing in Korean waters, and those of the general public. Later more wireless stations were established in Mokpo, Saishu (Quelpart), Fusan, Chinnampo, Seishin and in Urusan.

From September, 1937, the power of the Second Section of the Keizyo Central Broadcasting Station was increased to 50 kw. and stations at Husan, Heizyo and Seisin have been added. Subscribers numbering 2,000 at first are now 105,187.

The first *Telephone Service* was undertaken in 1902 between Keizyo and Zinsen, and subscribers numbered only 65. In 1903 an exchange service at Husan was started, and the number of subscribers increased from 310 at the end of that year to over

1,000 at the time of the postal union with Japan (1905). At that time only 16 lines were in operation, but expansion was rapidly pursued, and the following lines have been opened: in 1907 a long distance line between Keizyo and Heizyo; in 1911 between Keizyo and Husan; in 1921 between Keizyo and Moppo, and Keizyo and Gensan; in 1924 between Keizyo and Mukden; in 1925 between Zinsen and Mukden; in 1928 between Keizyo and Dairen, as well as between Zinsen and Ryozyun (Port Arthur); in 1929 between Keizyo and Kainei. In 1932 telephone connection by special apparatus was made between Husan and Shimonoseki and thus made possible the long distance service from Keizyo and Husan to Osaka and Tokyo. The 828 lines in operation in 1911 were increased to the large number of 11,408 ordinary and of 486 long-distance in 1936. With the rapid development of Manchoukuo, communications between that country and the principal centers of North Tyosen have daily become more active. To keep pace with this situation the Government-General erected telephone lines between Seisin and Tumen, between Nanyo and Tumen (thus connecting the telephone services between Seisin and Tumen), between Nanyo and Harbin, and ten other lines. In the following table details are given of the telephone service.

Year	Telephone offices	Telephone subscribers	Calls during the year
1905	6	1,065	8,489,530
1910	217	6,448	21,260,613
1920	529	13,142	59,974,029
1925	610	26,265	114,510,000
1930	681	32,664	176,455,929
1933	730	36,229	231,309,215
1934	750	37,694	243,063,067
1935	766	39,763	270,390,868
1936	791	42,605	296,533,620

Money Orders and Postal Savings

Business in *money orders* and savings was first undertaken by the Japanese post-office at Husan in 1880, and the offices handling such business numbered only 30 at the time of the postal union with Japan. On taking over control of all postal affairs, these offices were increased to 72, and since 1906 post-offices in places containing no inland revenue office receive and pay out money on behalf of the Government, a departure quite unknown in other countries. In 1910 the system of "hurikae tyokin," or postal savings transfer account, was started in Keizyo to facilitate the settling of commercial transactions, and subsequently, business relating to the receipt of local and national revenues, the flotation, sale, and repayment of public loans, etc., was even taken up by the post office for convenience sake. There are now 810 offices handling money orders and savings.

On account of the lack of any organ for monetary circulation, except the Husan branch of the Dai Ichi Ginko (a Japanese bank), the Japanese post-office at Husan was authorized to start business in ordinary Money Orders in 1880, and later on, those at other open ports followed suit. In 1900 the system of *telegraphic transfer* was introduced, and in 1903 it was made possible to telegraph money in large amounts for the greater convenience of business people. The total amount of money received and paid out during 1936 reached over Y271,288,000, showing an increase of 28 times and five times respectively as compared with 1905 and 1910.

Business in *Foreign Money Orders* was also taken up in 1880, though at first only with Hongkong. In 1881, exchange was opened with England, and in 1885 an agreement for exchange was conducted with France. This led to the gradual opening of exchange with other countries, and in 1908 the post-offices at Keizyo and seven other centers were specified as exchange offices under the international postal agreement. The amount of money dealt with in this way shows a decided upward tendency since the opening of exchange with China in 1923, and in 1924 passed Y1,000,000 mark. Foreign money orders received and paid out during 1936 amounted to Y3,930,000, showing a 43 fold increase as compared with 1908.

Japan-Manchoukuo Postal Money Orders

The Foreign Money Orders previously exchanged between Tyosen and Manchoukuo were limited to ordinary postal orders but in view of the special relationship between them, it became urgent to arrange a money order exchange. Therefore an agreement was concluded and enforced in August, 1934. With the

healthy developments of the State of Manchoukuo, the volume of money orders, between the two countries increased. A treaty between the two countries concerning Postal Affairs was concluded on December 26, 1935, and the exchange by Postal Transfer and telegraphic transfers has been regulated by this agreement put into force on January 26, 1936. It followed the postal system of Japan Proper almost entirely in addition to adopting a superior system in accordance with the rules of the International Postal Union in regard to transmitting money orders and acting as an intermediary. The amount of money paid and received in 1936 reached Y5,004,000 which is 17 fold increase as compared with that of 1934.

The Exchange of Postal Transfers between Japan and Manchoukuo was inaugurated on the basis of the agreement concerning Postal Affairs concluded between the two countries on December 26, 1935. This differing from foreign transfers which deal only in account transfers, tries to meet the demand of customers in general by paying, drawing, transferring and others following the system of Internal Postal Transfer Money Saving. The number of those paying and receiving reached 4,000, for the value of Y317,000.

Since the system of *Postal Savings* was first started at Husan in 1880, the number of offices taking up this important branch of business has gradually increased, and at the time of the postal union with Japan they numbered about 100. As there was no proper organ for saving and the people in general had lost all idea of it owing to heavy taxation and extortion, the number of Korean depositors in 1908 was only some 4,200, their savings amounting to no more than Y30,700, but with the constant encouragement given to thrift and economy, the amount of their deposits has gradually increased.

POSTAL SAVINGS

		Number of depositors	Total Amount	Average Amount per person
1910	.. ..	138,986	3,206,870	23.07
1926	.. ..	1,795,858	22,468,945	12.51
1927	.. ..	1,910,289	26,962,025	14.11
1928	.. ..	2,023,977	30,805,528	15.22
1929	.. ..	2,078,439	36,290,370	17.46
1930	.. ..	2,118,178	38,852,866	18.34
1931	.. ..	2,283,871	41,432,670	18.14
1932	.. ..	2,494,062	40,939,391	16.41
1933	.. ..	2,840,656	44,807,154	15.77
1934	.. ..	3,156,094	52,631,553	16.68
1935	.. ..	3,371,237	54,820,710	15.35
1936	.. ..	3,861,105	60,422,961	15.65

Post Office Insurance

The Post Office Insurance (Kan-i-Hoken) has become popular and successful in Japan Proper. Stimulated by this fact, the Communication Bureau, with the approval and consent of the Imperial Diet, started the same plan of insurance on October 1, 1929.

Although Post Office Insurance is a Government enterprise, it is by no means a profit making business. The budget itself is separate from that of the Government-General and is run under a special account. The Government maintains a strict balance of receipts and disbursements, and the net profit is to be divided among the insured.

There are two kinds of insurance, viz, Life Insurance and Old Age Insurance. Persons of either sex between the ages of 12 and 60 are admitted to it. The maximum insurable amount for one person is Y450. But the rate of interest which is the basis of calculation of the insurance fee is a little lower than that of Japan.

For the purpose of handling the business and for the convenience of the public, the Communication Bureau supervises 800 Post Offices scattered throughout Tyosen, in each of which applications are received, premiums are collected and insurance money is paid.

The following table shows results of Postal Insurance since October, 1929, to the end of the Fiscal Year 1936.

Year	New Contracts		Deaths		Policies in force at end of Fiscal Year	
	No. of Contracts	Insured Amount	Cases	Insured Amount	Contracts	Insured Amount
1929	125,129	26,255,278.80	357	78,364.20	118,429	24,879,436.50
1930	176,503	32,240,355.90	2,237	476,939.80	246,922	48,192,365.40
1931	170,666	29,377,173.90	3,972	814,866.50	330,785	62,504,572.30
1932	190,675	32,997,243.90	6,070	1,206,318.90	426,516	78,857,468.10
1933	195,713	34,675,193.30	8,232	1,561,730.20	531,505	97,220,281.20
1934	206,229	38,352,173.60	10,460	1,974,456.50	655,509	120,012,410.00
1935	238,550	47,773,767.10	14,778	2,813,019.10	810,411	150,242,424.50
1936	236,736	49,088,324.50	17,129	3,306,913.90	965,845	181,107,193.80

PERCENTAGES OF JAPANESE AND KOREAN POLICY HOLDERS

The number of Koreans contracting are increasing gradually. The percentage of Japanese and Korean policy holders at the end of the Fiscal Year 1936 was 28 per cent Japanese and 72 per cent Koreans.

NEW CONTRACTS BY FISCAL YEAR

Year	1929	1930	1931	1932	1933	1934	1935	1936
Japanese ..	55%	33	28	25	23	20	19	19
Koreans ..	45%	67	72	75	77	80	81	81

Electric and Gas Undertakings

The first *electric enterprise* was the building of a tramway in Keizyo by a joint-stock company organized by an American citizen in 1899, and in 1901 it started the supply of light in addition. Similar works were started in Husan in 1902 and in Zinsen in 1906, after which little progress was made, for at the time of union with Japan they still numbered but three with an aggregate capital of Y3,300,000 and a capacity of 1,380 kilowatts. Since that year, however, steady growth has been witnessed in meeting the general increase in demand for electricity, and these undertakings in 1936 numbered 21 in operation with a total capital of Y242,102,000 and a capacity of 524,000 kilowatts. Besides, there was one for business use and 252 for domestic use, totalling 275.

Coal and water are the two natural resources that can be used as motive power in generating electricity. Water is more abundant and is easier to develop economically. Therefore the Government-General decided plans to encourage using water as the chief motive power and, in case of heating power, to use Korean coal. But at present, except in two or three places, coal is in general use. The Government-General plans, on completion of the control of heating power plants in various places, to change coal for water.

The two most promising hydro-electric power sites lie on the *Tyosin and Kosuiin Rivers*, tributaries of the Yalu, with a capacity of 320,000 and 220,000 kilowatts respectively and there is another at Koryo, facing the Sea of Japan, with 80,000 kilowatts. In April, 1933, the *Tyoshin River Hydro-electric Power Company* obtained a charter to develop power and in January, 1934, commenced the erection of a plant to generate 140,000 kilowatts as the first instalment of their operation which was finished at the end of 1935. The construction of Number 1, 2 and 3 generators producing 84,000 kilowatts of the Second Power Station, planned to produce a total of 112,000 kilowatts, was completed and their operation began in January, 1937.

It is expected that the construction of Number 4 generator 28,000 kilowatts and the Third and remaining Power Station will now be undertaken. To supply current generated in the plant to Keizyo and Heizyo, two transmission line of 154,000 volts are necessary. In May, 1934, the *Tyosen Power Transmission Company* obtained official permit for business and in 1935 constructed a trunk line 200 kilometers in length and immediately began transmission to Heizyo. The company has built another trunk line about the same length as far as Keizyo for the same purpose. The company also obtained permit to develop 220,000 kilowatts by utilizing Kosuiin River, that flows into the Yalu, and hopes to finish another plant in 1940. The company, pending the commencement of the operation at the Kosuiin River Plant, plans to transmit current generated at the Tyosin River plant through a 110,000 volt transmission line of 310 kilometers, erected at the end of 1936, between Kanko and Seisin. In this manner it is hoped to control the sources of electricity in the North Tyosen. For the supply of current in the South the Tyosen Power Company plans to erect a large heating power plant in Neietu, Kogen Province, where there are rich deposits of anthracite. The plant together with transmission lines of high voltage was finished in autumn 1937, and the supply of current to Husan, Taikyu, Taiden and Kunsan and other large cities in the South is controlled at the Neietu Heating Power Plant. Twice the Government-General made countrywide investigations of the water power that might be utilized for generating electricity, and the result so far obtained is that 147 sites of promise, with a combined capacity of 2,370,000 kw. are ascertained to be capable of easy and profitable management. Of these sites 25 plants with 760,000 kw. have already obtained permits for operation. In view of the physical conditions of this peninsula, by damming the upper reaches of the rivers descending the gradual slopes to the west of the central

(Continued on page 119)

Present-Day Irrigation Methods in China

Many Primitive Devices Still Defy Economic Competition in the Orient

By O. J. TODD, in Civil Engineering

THE poverty of the rural population of China and the slowness of the government to recognize the need for heavy expenditures for irrigation works have conspired to keep the technique in this branch of engineering primitive in many respects. Only in very recent years have Western methods been adopted in bringing water to Chinese farms, and then the experiments have been restricted to a few projects of rather limited size. Even in these cases hand labor has played a most important rôle in the construction work, and the use of modern machinery has been held to a minimum.

So in discussing the methods used in China to-day for developing irrigation we must necessarily be reviewing much of the practice of the past—well-established practice that seems to have fitted into the economy of the country. It will be noted that deviations from such practice have been on a rather small scale and have not required very heavy capital outlays. Consideration of more thoroughly Western methods has flourished among the younger engineering graduates, but the actual raising of the sums of money required or the initiation of large projects that would run into as much as \$1,000,000 (U.S.) apiece have not become matters of history. Nor can any immediate change in that direction be expected in view of the present upset political conditions that will impoverish the nation and make other very necessary outlays for human needs precede irrigation works in the national budget.

The modern trained engineers of China desire a break with the past and an adoption of the best Western practices in irrigation just as rapidly as they can convince their government that the results to be attained warrant the expenditures entailed. Most likely the experiments on small modern projects conducted during the past six to eight years in Shensi Province will do much as pioneer measures to produce the necessary change in outlook by those in political power.

In an earlier article I briefly sketched the work of the most recent irrigation practice in China in an article called "The Progress of Irrigation in North China." Short descriptions of four rather modern projects in north-western China were given, indicating the nature and sizes of structures built, areas of the several districts served, financial outlays involved, and other features. In the present paper I shall tell something of the types of irrigation, ancient and modern, in use to-day in various parts of China, with some particulars as to the hand methods or native mechanical devices employed. Some of these devices are being supplanted, while others still defy competition under the present economic setup.

Of the various native methods of getting water on to the land, perhaps the bamboo wheel is the least efficient in use of power, but it costs little and is still used in remote western China from Lanchow in Kansu to the Indo-China border. The wheel is placed at the edge of a running stream, and the water in the channel diverted to operate it moves the paddles which alternate with the bamboo buckets that are placed on its periphery. These buckets are arranged at an angle, with one end of the bucket open, so as to allow dumping into a trough placed at one side near the top of the wheel. From this trough, which runs parallel to the plane of the wheel, another long trough leads away at an angle of 90 deg. to the near-by lands to be watered. These wheels, which as a rule are from 20 to 50-ft. in diameter, may be kept going constantly in irrigation season except during flood stages, when they must be removed to escape destruction. They are all "homemade" and readily repaired. For many centuries in South China this means of raising water for irrigation has been employed.

Forty Thousand Irrigation Wells in One County

The "Persian wheel," with its endless chains with long, shallow buckets, more than a foot in spread between chains, is a far more reliable means of getting water to crops. It is extensively used in the northern provinces of Hopei, Shantung, Honan, Shansi and

Shensi where gravity irrigation by direct diversion from streams is not possible and good well water is available at reasonable depths. Probably Hopei, with its many wells along the Peking-Hankow Railway, uses this method of irrigation to the greatest advantage. A survey made in 1930 and 1931 under my direction for the Governor of Hopei, covered three counties in that province. In one of these, Ting Hsien, we found 40,000 wells for irrigation exclusive of those in the villages. These had been dug, for the most part, since the beginning of the present century—25,000 of them between 1916 and 1931. This stimulus to modern well digging came partly from America after the severe drought famine of 1920-1921, when costs for the labor to construct many of the wells was contributed by relief agencies. The wells average 30-ft. in depth and 6-ft. in diameter, and the brick for curbing was furnished by the land owners. The cost per well was little over \$15 (U.S.) for labor and a similar amount for curbing bricks and board bottom.

The water table may be anywhere from 15 to 40-ft. below the ground surface. Most of the wells are so dug as to accumulate 5 to 6-ft. of water during the night—a sufficient supply for the next day's irrigation. One such well in Hopei can serve about three acres of land where the water table is normal. Where the soil is not too tight and the inflow rapid, as much as seven or eight acres may be served from one well. A good pumping outfit of the Persian-wheel type costs from \$30 to \$50 (U.S.), and the cost for operation is light. The power is supplied by a donkey or cow hitched to a short sweep turning a large geared "bull-wheel," the cogs of which mesh with those of an upright wheel that turns the endless chains. Formerly these sets were made entirely of wood and produced locally. Now they are made of metal and sold at about the price of those made of wood alone.

Hand Windlasses, Weighted Poles, and Dragon Pumps

The hand windlass is used in the same regions that employ the Persian wheel. Those farmers who cannot afford the more expensive outfit for pumping, and have a surplus of human labor rather than of domestic animals, use a windlass costing about \$3. In small wells one such windlass is enough, for a strong Chinese farmer makes good progress raising water 15 to 25-ft. with a woven willow basket at the end of a rope, bringing up five gallons at a time. Where the wells are larger two hand windlasses are used at once side by side. With a good shade tree or two planted close to the well, and the men stripped to the waist, this work does not seem too arduous especially when begun in the cool of the morning before sunrise. Farm labor in North China costs 15 cents per day, or even less where there are many sons in the family. Under these conditions this method of irrigation has much to recommend it as being economically sound.

In Suiyuan Province one sees the weighted pole used over the curbed well to draw water up 10 to 15-ft. for watering gardens, poppy fields, and even wheat. The pivot over which the weighted pole is swung is a short wooden axle fitted into holes in two stone posts spaced 2 to 3-ft. apart and back a few feet from the well's edge. The bucket is attached to the short and heavier end of the pole by 10 to 15-ft. of rope, and a stone is attached to the long end of the pole to help raise the bucket when full. So the operating farmer uses about the same energy to force the empty bucket down into the well as he does to help raise it when filled. Five gallons or more are brought up per trip by means of this device—the same quantity as with the hand windlass, and the work seems easier. The cost for the pole or sweep, the pivot, and the two stone posts in place should not exceed \$10.

In the Yangtze region the dragon pump, or *shui lung*, is used extensively. It consists of a wooden rectangular trough 12 to 16-ft. long, as a rule, and about 1-ft. wide, with an endless chain of wooden paddles that just miss touching its sides. The paddlechain passes around a sprocket wheel fastened to the rotating axis where power

is applied. The power may be human or animal or even steam, as in the case of one rather modern farm near Tientsin where a battery of such pumps was attached to a long axis that was engine-driven. Human beings operating treadmills, and holding onto a bar that helps them stand erect, seem to have the monopoly on operating the dragon pumps along the Yangtze. Water buffaloes on long sweeps operate these pumps in Kiangsi.

As such pumps operate best with the trough sloping at an angle not over 30 deg. from the horizontal, they are sometimes placed in batteries of two or three to divide the lift. Troughs 20-ft. or more in length are rare. Good local carpenters can make a 14-or 15-ft. unit for less than \$10, the cost including both lumber and labor.

Where the water in a canal or stream is within 4 to 6-ft. of a field, the willow basket operated by two men with ropes is frequently used to throw the water up this additional height. A piece of bamboo or reed matting is usually placed at the stream edge of the field to prevent wash and direct the water into the irrigation ditch. The men stand 10 to 12-ft. apart on opposite sides of a sump dug at the side of the stream and handle a light rope in each hand attached to the sides of the basin-shaped basket. Dipping and dumping are thus done rhythmically and rather effectively. At times fields are irrigated by raising water up two such levels of 4 or 5-ft. each. This type of irrigation is found in many parts of North and Central China. Where the lift is only 2 or 3-ft. this device is frequently employed also to unwater pools on construction work.

Larger Irrigation Projects Served by Gravity

The larger irrigation projects of China are served by gravity systems, river water being diverted directly from the stream with or without the aid of a diversion dam. In the cases of all irrigation from the Yellow River no diversion dams are employed. The water is taken into the canal systems when the river is at high stages (summer and autumn). This is true around Ningsia, in the Haotao region, at Saratsi, and with the Mongol canals near Tokoto. The same system was employed at times on the Fen Ho in the Taiyuan Valley except in low-water stages, when earth dams were constructed across the river and all the water was saved for the lands. These earth dams were permitted to remain for a certain number of days only. Then each in turn was broken to release the water to another dam a few miles downstream to feed another set of canals, a zoning system having been agreed upon for the whole Taiyuan Valley. Now three masonry dams or gate structures do the work of eleven of those temporary earth dams of former years.

The most famous of China's irrigation projects is that near Chengtu, Szechuen. It is many centuries old and is fed by the Min River, which is turned through a cut in the rocks to supply a system of canals controlled by native stop-log gates. On the plains watered by this system nearly 6,000,000 people live safely while their rice and other crops are guaranteed by the irrigation. In Shensi, the Wei Pei, Lo Ho, Wei Ho and Mei Hwei projects are similar in that they are canal systems fed by diversions by low dams from the supplying rivers.

These projects are the most desirable and economical, when the original cost can be charged over a series of years. The water rates are usually light (about \$1 per acre per year), and the provincial authorities, with national or foreign relief aid, have stood back of the work to a certain extent and given it their blessing. The pioneering in these developments, however, has often been greatly aided and stimulated by men outside the province concerned, as they have been able to bring in the greatly needed funds. Most of the recent development of modern irrigation works is the by-product of relief work after drought famines.

In very recent years many kerosene operating centrifugal pumps have been installed in the Yangtze delta to replace dragon pumps and coolies. Where lands are very valuable these installations are said to be warranted. Their popularity will depend on operating costs, and it is questionable whether they can compete with coolie labor at 15 to 20 cents per day. In unwatering canals during excavation in Suiyuan in 1931 such engine-driven pumps were found to be considerably more expensive, on lifts up to 8-ft. than coolie labor bailing with five-gallons kerosene cans and passing water up in two steps of 4-ft. each. This test was made, however, where labor was cheap and fuel costs high. Near Shanghai the relation is somewhat reversed.

During the past ten years, three steam-operated pumping plants have been installed close to the Fen Ho in Shansi to lift water a height of 15 to 20-ft. into canals for irrigating cotton lands. However, various difficulties have overtaken these projects. Farmers have refused to pay the water taxes, saying they did not need the service except in dry years or when rainfall was not well distributed. Floods have injured the plants because of insufficient river training. Provincial officials have been indifferent. Incompetent men have been placed in charge of valuable equipment, and boilers have been burned out. In short, Shansi does not seem ready for such improvements, although without them the lands dependent upon irrigation will not produce crops in dry years. The people as a whole are still fatalists and dry farmers.

Storage of Flood Waters Impracticable

The silt in the rivers of North China makes storage of flood waters impracticable. Reservoirs would be rapidly filled by such waters as those of the Fen Ho in the summer months when it carries solids up to 23 per cent by weight. The King Ho in Shensi in flood carries as high as 50 per cent silt by weight at the intake of the Wei Pei irrigation project. No storage is possible there. Similarly the main Yellow River near Loyang, Honan, in August 1933, had a silt content of more than 40 per cent.

In some cases, such as the upper Fen Ho, the winter flow may have a silt content less than one per cent, and might safely be stored in reservoirs built with ample gates to pass flood water. This clear water could be released during the spring months to supplement the ordinary river flow in aid of downstream irrigation. While such storage seems practical, no large reservoirs of this sort have been constructed. In fact, there are no irrigation storage reservoirs of consequence in China.

In south-western Shansi there are possibilities for high-lift pumping to irrigate nearly 300,000 acres of good cotton land at an elevation of approximately 250-ft. above the Yellow River. In case cheap hydro-electric power should be developed at the Hu-kou Falls, 50 miles north, it is possible that such high pumping might be economically feasible. As yet, however, China has not gone in for high-lift pumping to extend irrigation, and it may be many years before such developments take place.

One of the latest innovations in irrigation practice in China—siphoning—has been tried along the Yellow River in Honan and Shantung provinces within the past five years. It is connected with land reclamation as silt-laden water is desired to cover alkali lands, particularly in eastern Shantung near the mouth of the Yellow River. A small priming unit is maintained on the dike where two parallel iron pipes 24-in. in diameter are laid. With the valves on the land side closed, all air is readily removed from the siphon pipes after lowering intake ends into the river. These devices are of German manufacture and seem to work well, though the quantity of water thus handled is small.

Up to the present, cheap hand labor has played a large part in all irrigation development in China. It has made possible the building of a number of projects at a total cost of \$5 to \$6 per acre of land to be served. Wherever the cost has run as high as \$10 per acre, as with some of the pumping plants in Shansi, the farmers have objected to the tax of \$1 per acre per year for operation and retiring the original loan for plant.

Hand Labor in Construction

To the Westerner the most interesting feature of Chinese construction methods is use of hand labor in quantity to handle excavation work. In North China in recent years hundreds of miles of canals have been dug by hand, using the old-fashioned basket method. One workman has two rather flat woven willow baskets suspended by four light ropes from the two ends of his carry pole. Into each basket he loads approximately 60 lb. of earth and walks out of the canal to the dump with this load of 120 lb. Working steadily for ten hours, he moves 4 cu. yd., at an average carry of 100-ft., if the digging is in good ground and the depth moderate. His earning will be 15 to 20 cents for this task. All such work is done on the piece basis except in very wet soil or where there is drilling in cemented material. In cases where sand is encountered a large, deep basket, carried by two men by means of a heavy pole put under the handle, is used. This way of moving earth is less

popular than by the single-man two-basket method. Nor is the wheelbarrow preferred as a rule.

In deep-cut excavation the two-basket man carries his load up a long earth ramp or up a set of steps he has carefully cut in the earth along the side of the canal. In still deeper cuts the tripod with pulley is used, and men in the bottom of the canal pull the rope that hoists a basket loaded with 60 lb. of soil. This is, of course, an expensive way of earth moving, yet it fits into Chinese economy. By this method earth can be taken from a cut 40-ft. deep at ten cents per cu. yd.

Quarrying of rock and placing it in structures is all done by hand in China, as is the mixing and placing of concrete. The wheelbarrow and shovel are the chief tools required. Everywhere man-power sets the pace for the work to be done.

It is interesting to the Western engineer that the Chinese like tunnelling. They do not hesitate to tackle long tunnels through the fairly easily worked limestone hills of Shansi in order to bring water from one valley to another where it is more needed for irrigation. Infinite patience and low wages make these things economically sound in cases where they would not be so considered in the West.

So China moves along, showing some development and a willingness to make comparisons between Western practice and her own old ways. But in most of these experiments with the more modern practice of the West, China continues to lean strongly on the brawn of her hard-working sons, who charge but 15 to 20 cents a day for their services—for she knows that high-priced machinery has to be paid for in real money, and so does fuel oil or gasoline. She knows that canals can be cleaned by hand to-day almost as cheaply as they could centuries ago. She knows that she is long on man-power, and that it has to be fed and therefore must be employed wherever possible. So her technique in irrigation extension is bound up closely with her population problem; the modernizing of the one will perhaps go along with the solving of the other. Modern pumps will be slow coming into China, and storage reservoirs will be very rare in North China until soil-erosion control is well in hand. And such progress in irrigation development as there has been in the past ten years may be considered very satisfactory by those who realize how little China has with which to pay for anything except her own native labor.

To sense a situation where man-power is predominant one would have to watch eight coolies throw a stone "flapper" in the air 8-ft. high or more and bring it down on a dike that needs packing. The ease and precision with which this 90 lb. stone is thrown and then brought down with a swift draw on the ropes, which makes it strike the earth perfectly, reminds us that patience and brawn have built China's utilities in the past and are still at work. As economical working units men still underbid mules on irrigation work.

Communications in Korea

(Continued from page 116)

mountain range, forming the backbone of Tyosen, the water can pass to the eastern coast, falling in steep cataracts to provide the sources of great power. This reservoir system, near the sources of the rivers, forms the special feature of ninety per cent of the Korean Electric Power Plants.

There are two gas-producing undertakings, one at Keizyo and the other at Husan. In March, 1937, private homes using gas numbered 19,300 and the total production was 10,050,000 cubic meters. To keep pace with the economic development and advancing culture in recent years, the demand for gas at homes for heating purposes grows year by year, and in large cities such as Taikyū, and Heizyo, permission has been granted and operations started in November, 1936, Zinsen and other thriving towns as Seisin, Yuki and Rasin have submitted applications for gas works and other principal towns are following suit. Control of gas was formerly exercised by the police authorities, but, in view of the fact that the business is done as a side line by electric companies, it was transferred in 1919 to the Communications Bureau so that both might be under the same supervision.

Air Conditioning of Manila Railroad Coaches

(Continued from page 106)

The distance from Manila to Legaspi on the railroad is 293 miles (472.29 km.) the present fare in the air conditioned cars is \$7.95 one way. This is equivalent to approximately \$0.025 per mile. Since there are no first class coaches on the run to Legaspi without air conditioning there is no direct comparison of rates with or without air conditioning. However, on the other runs of the Manila Railroad, the first class fare in coaches without air conditioning is approximately \$0.021 per mile. The air conditioning is costing the traveller about $\frac{1}{2}$ cent a mile.

Dairen Port Facilities

SUCH huge quantities of goods are now piled up at the Dairen wharves that the South Manchuria Railway Company is planning to extend present accommodation by at least 50 per cent. This will be carried out under either a seven or eight year plan. The cost for this will be approximately Y80,000,000 to start from the next railway fiscal year, beginning on April 1. An appropriation of Y9,000,000 is included in next year's budget to allow for the first year of expansion.

The current congestion is being caused by the vast increase in imports, largely of heavy industrial goods which are coming in for the execution of the five-year industrial plan for Manchoukuo, as present accommodation as to godowns is entirely unable to cope with demand. Dairen being essentially an export harbor. A minor form of chaos reigns as to the stacking of goods which cannot be laid away indoors but some form of order is now being obtained.

A considerable shortage in rolling stock is also to some extent responsible for the piles of goods at the Dairen wharves. An order has been placed for 1,700 freight cars and locomotives costing about Y45,000,000. These should be delivered by October next. About 2,000 flat cars were bought last year but proved completely insufficient to deal with the quantity of goods arriving at this port.

Again there is a dearth of berthing facilities. Recently a fourth pier was constructed and for the time being nothing further along this line can be done. Therefore, starting with this year on an expenditure of Y1,400,000 additional tugs and lighters are to be obtained to load and unload vessels lying offshore.

This plan includes a 250-ton tug with ice-breaking equipment, three lighters of 60 tons each, one new 100-ton tugboat and one second-hand tugboat. When these small crafts arrive, the port will have 164 lighters and 23 tugboats.

One scheme further is being considered which is to increase shipping accommodation at Kanseishi, across Dairen Bay, where all coaling is done to modern equipment. This will have to wait, however, until the shoreline has been largely improved.

To ease the burden on Dairen in connection with the five-year industrial plan for Manchoukuo it is believed that the Changchun government will arrange for the development of the three Korean ports Rashin, Seishin and Yuki, the work to be passed over to the S.M.R.

The revised plan calls for a tremendous rise in the export of coal to Japan and at the moment these three ports, from where Mishan coal is shipped, are not able to deal with more than 600,000 tons annually, whereas the plan calls for the export of 1,500,000 tons by 1941.

As the coal requirements for Manchoukuo by that time cannot be estimated adequately, there is some hesitation as to setting this scheme going.

Meantime the plan for forming the Manchuria Shipping Company is being carefully studied. This is for forming a mercantile fleet aggregating 50,000 tons to be capitalized at 2,000,000 yuan. Those to invest in this corporation would be the Changchun Government, Dairen Kisen Kaisha, South Manchuria Railway Company, Yamashita Kisen Kaisha, the Mitsui's and the Mitsubishi's.

In the meanwhile various snags are visualized as to the creation of this company. Unless the Japanese Government wishes this, it will be impossible of materialization. Consent from the German Government would be necessary as the Third Reich is, next to Japan, doing more business with Manchoukuo than any other country. A Manchoukuo merchant ship would run into many difficulties in ports of countries which have not yet recognized its government.

The World's Greatest Silver Hoard

(The Mining Journal)

NEWSPAPER stories have told of the modern steel and concrete vault, with all latest appurtenances for the protection of treasure, recently completed on the grounds of the Military Academy at West Point; and of the contract for trucking about 35,000 short tons of silver bullion, about one-half of the Treasury's total silver stock, from New York City to the new storage place. The vault is 252 feet long, 166 feet wide, and 22 feet high. Entrance to the vaults is by way of two sets of steel doors, between which is a loading platform for trucks. The three outer doors, through which the trucks will be driven with the metal, lift vertically, powered by an electric switch. The inner doors roll up and down, by electric impulse. The building is air conditioned. Within the inner doors is a lobby, and from this lobby a single steel door, drill-proof and flame-proof, leads into the vaults. There are observation turrets on the four corners of this massive tube. Floodlights and an elaborate system of electrical locks will add to the safety of the store within. The structure cost \$529,000.

The Associated Press recently gave particulars of the trucking contract, as follows:—

The Treasury hired Peter J. Malley of New York to-day to haul \$1,290,000,000 worth of silver from New York to a new storehouse at West Point. He will be paid \$157,000. Malley's trucks will be protected by 55 Coast Guardsmen on the 50-mile trek. He will have to make the trip five days a week for nearly ten months to complete the job. Mr. Malley said his plan was to run an average of 25 bus-type transportation trucks each day five days per week, and added: Each truck would carry about 350 bars of silver, weighing about 72 pounds each, a total load of about 11 tons, having a statutory value of about \$450,000 and a market value of about \$150,000.

The United States has so many problems that most of us forget the silver problem until it bobs up again. It bobbed up about 100 years ago, and again in 1878-1893—a fifteen-year period of silver-buying which was ended by President Cleveland. The country was in the midst of panic when he called Congress together to stop the purchases, and it was done.

This ended silver purchases under the acts of 1878 and 1890. The aggregate of these purchases was approximately 459,949,000 ounces, and the cost was \$464,210,000.

During the World War India's commercial exports became so large that means of payment were lacking and the United States sold its stock of silver dollars to England, which would have been fortunate, if the silver party in Congress had not insisted upon the Pittman Act, under which this silver was later replaced in Treasury vaults at a buying price of not less than \$1.00 per ounce.

There the silver problem rested until the War inflation was followed by the world depression, when many people found themselves short of money, and called upon the government for more; and more silver was proposed. It was urged that if the price of silver could be raised to \$1.29 (former U.S. coinage rate) the purchasing power of China would be increased, our exports to China would be increased, bimetalism would be established, and prosperity would flow over the earth.

Silver Purchase Acts of 1933 and 1934

At a silver conference in London in 1933, under the leadership of the United States, eight nations made an agreement for holding or buying silver, the United States to buy not less than 24,412,410 ounces (the estimated amount of its own production). These purchases began in December, 1933, at 64.64 cents per ounce, the Government exacting 50 per cent of the coinage rate (\$1.29) as "seigniorage." The market price was about 43 cents.

This was only the beginning. Following the gold standard act of 1934, a bill passed the House for the purchase of "not less" than fifty million ounces of silver monthly, and was pending before the Senate. As a substitute measure the present law was enacted

in June, 1934. Its principal provisions appear in Sections 2 and 3. Section 2 reads as follows:—

It is hereby declared to be the policy of the United States that the proportion of silver to gold in the monetary stocks of the United States should be increased, with the ultimate objective of having and maintaining, one-fourth of the monetary value of such stocks in silver.

Section 3 authorized and directed the Secretary of the Treasury to buy silver "at home or abroad" at such times and on such terms as "he may deem reasonable," but "not in excess of the monetary value" (\$1.29), and only until the Treasury's silver holdings equalled 25 per cent of its combined gold and silver holdings. It was understood that the President did not favor the bill, but desired to move by means of international action. Senator Pittman so stated in offering the substitute and said that while he (the Senator) did not share the President's view he was willing to compromise.

This act, like the acts of 1878 and 1890, was passed in confidence that the proposed purchases would advance the market price of silver bullion to the coinage rate, and broaden the monetary use of the metal.

On August 9, 1934, the President issued a proclamation nationalizing silver, as gold had been nationalized earlier in the same year. Existing commercial stocks of silver were taken over by the Government at a fixed price, the Treasury claiming the difference between that and \$1.29, as seigniorage. Purchases abroad also began promptly. In August a shipment of 400 tons from London to New York was reported as the largest shipment of silver ever made across the Atlantic.

However, instead of benefiting China and our trade with China, the rising price of silver had the opposite effect. Silver being the money, the rising price for the silver coins meant lower prices for the products of the country. Even in 1932 and 1933 the low prices for Chinese products had caused an adverse trade balance, with an outflow of both silver and gold. Now, Chinese traders were shipping silver direct to New York, to be sold to the United States Government.

Within three months from the enactment of the law, the Minister of Finance of China addressed representations to the United States Government, the gist of which was contained in the following paragraphs:—

"The National Government feels obliged actively to seek means of avoiding further hardships of silver fluctuation. It considers that China should not alone maintain the silver standard and is considering the gradual introduction of a gold basis currency, which will necessitate the acquiring of gold.

"Since the American government desires an increased proportion of silver in its monetary reserve, the National Government desires also to ascertain in principle whether the American government is willing to exchange with the Chinese government gold for silver."

In October, 1934, the Chinese Government placed an embargo on exports of silver, but as the world price continued to rise, smuggling developed on an important scale. Speculation was active, even running ahead of the Treasury bidding. In April, 1935, the London price reached 81 cents, with the Treasury paying 77½ cents for domestic silver.

In November, 1935, the Chinese Government took the final step of "nationalizing" silver, and providing for a managed paper currency. Meantime the London market had become top-heavy and was not supported by Washington. The price of foreign silver declined from 81 cents to 43 cents, delivered at New York, while the price of domestic silver was held at 77½ until January 3, 1938, when it was dropped to 64½.

China Abandons Silver

In May, 1936, the Chinese Government sought the aid of the United States in stabilizing its bank-note currency in relation to

the monetary system of the United States, by purchases of silver from China. An agreement was entered upon by which the United States Government agreed to buy an unnamed amount of silver from the Chinese Government, giving dollar credits or gold for the same. This agreement has been renewed several times.

This silver has come to the States from London, where it had been shipped, by way of Hongkong, last year, and delivery has been made in New York. In the first six months of 1938 these receipts of Chinese coin amounted to about 140,000,000 ounces, of the value of \$63,000,000, and since November have aggregated 190,000,000 ounces valued at \$84,000,000. Total receipts of silver from China under the act of 1934 have been unofficially estimated at 300,000,000 ounces.

Although full information as to the proceeds of these purchases has not been made public, it is believed that aside from gold that has been earmarked, China's receipts have been expended or retained in the form of bank deposits.

Although these cash sales of Chinese coin in the United States began more than two years before the outbreak of the undeclared war with Japan, and have no relation to the War, they evidently have supplied the Chinese Government with a substantial fund available for expenditures abroad.

Operations Under the Silver Purchase Policy

The following table summarizes results under the silver purchase program since the authorization and direction of foreign purchases a little more than four years ago. It shows that when the law went into effect the Treasury held \$7,856,000,000 of gold, and under the terms of the new act should have \$2,619,000,000 of silver, valued at \$1.29 per ounce, or 2,026,000,000 ounces. The total silver holdings, including subsidiary coins, were 693,000,000 ounces. The amount of silver to be acquired was 1,333,000,000 ounces. At the end of June, 1938, the amount of gold in reserves was \$12,962,000,000, and after buying 1,687,000,000 ounces of silver, at a cost of about \$900,000,000, the Treasury was still short 970,000,000 ounces of the required amount. The increasing gold stock has increased the amount of silver required.

RELATIVE HOLDINGS OF GOLD AND SILVER

(000,000s Omitted)

June 30	1934	1935	1936	1937	1938
Gold reserve (\$)	7,856	9,115	10,608	12,318	12,962
Required silver (\$)	2,619	3,038	3,535	4,106	4,320
Required silver (oz.)	2,026	2,350	2,735	3,176	3,341
Cumult. acquisitions (oz.)	9	447	1,057	1,281	1,687
Silver in Treasury (oz.)	454	880	1,474	1,676	2,062
Silver in subsid. coin (oz.)	240	252	268	290	301
Total stock (oz.)	693	1,132	1,742	1,966	2,371
To be acquired (oz.)	1,333	1,318	993	1,210	970

The acquisitions include both domestic and foreign silver, but it is interesting to know that purchases of foreign silver aggregated 1,353,000,000 ounces, against 333,000,000 ounces acquired at home of which 220,000,000 ounces were newly mined.

The influence of the act of 1934 upon silver prices has been noted above. The influence of rising prices upon world silver production, and the influence of the silver purchase act upon the distribution of the metal, are shown by the following table of silver production, melted coin and United States Government purchases, in the five years 1934-1938, as follows:—

(In Millions of Fine Ounces)

Year	U.S.	World Silver Production Foreign	Total	Demonetized Silver	U.S. Treas. Acquis.
1934	33	157	190	258	306
1935	46	170	216	390	535
1936	63	188	251	304	333
1937	69	207	276	189	313
1938 (6 mos.)	—	—	—	—	201

The total weight of silver coins from over the world melted down by the United States in the last four years has exceeded

its purchases of newly-mined silver. For each ounce of newly-mined domestic silver, we bought 62 ounces of foreign silver. This is the net result of the effort to restore bimetalism throughout the world.

Other Results of the Policy

Among other results of this silver-purchasing policy may be noted:—

- (1) That China, the one remaining country using silver as standard money, and formerly a net purchaser of approximately 100,000,000 ounces per year, has been driven to a managed currency, and is selling her age-old stocks of silver on the world market.
- (2) That the dream of re-establishing bimetalism has faded out forever. Although foreign speculators traded actively on the bull side of the market while the United States Government was clearly behind it, they stopped buying when the U.S.A. showed any sign of weakening. Not one of the other seven governments participating in the London Agreement even suggested renewal at its expiration, December 31, 1937. Purchases of their own silver production made by other parties to the agreement were finally dumped on the United States.
- (3) In its efforts to raise the price of silver, the United States was draining the world of existing stocks, and the price has been sustained only by the persistent buying of this country. The price dropped from 81 to 43 cents, because United States buying slackened, and is sustained at that price by United States buying.
- (4) The Treasury statement of July 1, 1938, shows an unexpected balance in the General Fund of \$446,088,793 derived from "seigniorage," on silver bullion acquired under the act of 1934, and on the asset side, 870,940,306 ounces of silver, valued at average cost, 55 cents per ounce, totalling \$479,600,198. The latter entry is new, appearing July 1, for the first time. It shows silver upon which "seigniorage" has not been made available for appropriation, and is a commendable innovation.

That this silver was not needed for our monetary stock is shown by the fact that in the first half of last year, one billion dollars of imported gold was bought and "sterilized" by the United States Government, to prevent its being used in the monetary system.

What of the Future?

Where do we go from here? The act of 1934 remains in force, silver production in the United States has increased from 24,000,000 ounces in 1932 to 69,000,000 ounces in 1937, world production increases as shown in above table, and most of it is sold to the United States Government. Silver importations in the first six months of this year have aggregated approximately 260,000,000 ounces and cost \$112,000,000. Who is paying the bill, and what returns are the American people receiving on the investment? At no time after the purchasing campaign began could the United States have offered silver for sale without causing a panic, with a collapse of world prices, and this will continue to be so. The Treasury reports the cost of administering the silver purchase act (not including cost of silver) for the fiscal year 1937 as \$287,000.

This review of the latest silver legislation and its results can be closed with no more appropriate comment than the following brief extract from the message of President Cleveland summoning Congress of the United States to special session in 1893, and urging repeal of the silver-purchasing act of 1890. He said:—

The people of the United States are entitled to a sound and stable currency and to money recognized as such on every exchange and in every market of the world. Their government has no right to injure them by financial experiments opposed to the policy and practice of other civilized states, nor is it justified in permitting an exaggerated and unreasonable reliance on our material strength and ability to jeopardize the soundness of the people's money.

In the last session of Congress Senator Bailey of North Carolina offered a resolution directing that silver purchases should cease, but apparently it was not discussed.

Engineering Notes

INDUSTRIAL

ALUMINUM PLANT.—Contributing much toward the promotion of Japan's aluminum industry is the Nippon Aluminum Kabushiki Kaisha, which has its head office in Marunouchi, Kojimachi, Tokyo, and factory in Takao, Taiwan. Capitalized at Y10,000,000, the company founded its factory in Taiwan in view of its proximity to the Dutch East Indies, Bintang island, and other islands in the South Seas yielding bauxite, the clay-like aluminum hydroxid from which the light metal is obtained. The plant began operation in November, 1936.

BIG MACHINERY ORDER.—What is believed to be the largest single order for coal-washing plant ever received in Britain has been placed by the Chinese Engineering and Mining Company, of London, with a firm of colliery engineers at Cheadle Heath, near Manchester. The order is for a complete coal washery to deal with 500 tons of coal per hour, and will involve the shipment to China of 2,000 tons of steelwork and machinery. The order has been placed on behalf of the Kailan Mining Administration, which operates a group of coal mines near Tientsin. The Administration is the largest organization in the coal-mining industry in China, owning its own port, with a fleet of steamers and depots at all the important centers in the Far East. The order is the outcome of a series of investigations carried out at the Administration's mines by Dr. W. R. Chapman, a well-known British mining engineer.

WRECKAGE OF WAR.—Returning from an inspection trip in China, Mr. Yoshiteru Kogane, Director of the Bureau of Mines of the Department of Commerce and Industry in Tokyo, reported that the Shihweiyao mining property near Hankow, including the famous Tayeh iron mine and two brand new blast furnaces adjacent to it were completely wrecked by the Chinese before they retreated from the Wuhan area. The two 200-ton blast furnaces had been installed only a few weeks before the fall of the tri-borough and had never been ignited. Though the Japanese found a stock of 290,000 tons of high-grade iron ore when they took possession of the Tayeh mine, further operations will be impossible for at least a year to come, for all equipment has been destroyed or carried away. The ore cannot be removed from the dumps either because all rails in the neighborhood were broken up by the retreating Chinese, and the Yangtze is already too low to carry ore-laden vessels.

ENGINEERING SCHOOL.—With a fund of Y2,000,000, the Osaka municipal office will build an engineering school in Osaka before April next, in order to meet the growing demand for young engineers, it has been decided by the municipal officials. The proposed school will have two departments, namely, machine and electrical engineering, and will accommodate about 100 students. The entrance qualifications will be the completion of primary school education and the school term will be five years.

MINING

TO INCREASE OUTPUT.—With a view to increasing the output of non-ferrous metals, particularly lead and zinc, according to the industrial five-year plan, the Manchoukuo government has requested the Manchuria Lead Mining Co. and the Anfeng Mining Co. to exploit deposits actively. It is reported that the Yangchiachangtze mine, now being worked by the Manchuria Lead Co., has an estimated deposit of 2,100,000 metric tons and that the ore contains 12 per cent of lead and from 40 to 50 per cent of zinc. The deposit in the Tsingchentze mine, which the Anfeng Mining Co. is exploiting, is estimated at 1,600,000 metric tons. The mines can each turn out 3,000 tons of ore monthly.

GOLD IN SIBERIA.—A party of gold prospectors sent out by the Institute of Research in Gold Prospecting has recently returned to Moscow after having carried out successful work in the gold-fields and mines of Yakutia, Baikal, Kazakhstan and the Urals. A big expedition, led by the geologist Yudin, working in the region of the Lena and Bodaibo Rivers, discovered several buried auriferous deposits, which will considerably enlarge the Lena gold-field. On the eastern slope of the Urals, to the North of Chelyabinsk, the geologist Maximov found old gold bearing channels having no connection with the existing river system. The geologist Dembo discovered several new gold deposits in the taiga of the North Yenisei. Interesting results were obtained from the geophysical investigations of the Kumak deposits, in the South Urals, where ore anomalies were revealed. It appears that gold occurs not only in the present area of the mine, but also to the north and south of it. A new vein of scheelite was found by the geologist Steinberg on the Berezovo deposit, in the vicinity of Monetnaya.

A group of prospectors working on the Kolvchak gold-field (Oirotia) of the West Siberian Gold Trust—"Zapsibzoloto"—recently found a gold nugget weighing 16 lbs. 5 ozs.

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